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MORE COOPERATION IS STILL NEEDED; IT WORKED WELL IN 1926

One of the many business leaders who have recently discussed the prosperity of the United States, and its probable continuance during the new year, said the causes of it were high wages, better commercial practices, prohibition and abundant credit.

No doubt these are important girders underlying American prosperity, but opinion probably will differ as to which is the real mudsill—the supporting foundation—of the good times the country has enjoyed during the last five years. As a matter of fact, they are all interwoven, each contributing its share and working together toward the desirable end that all the people shall be comfortable, and by industry and thrift be able to have the advantages belonging to the American standard of living—and that, as all concede, far surpasses that of any other nation in the world.

More efficient business practices lead to greater production, make possible high wages and improved credit, and good wages means the bigger general trade which forms the circle that keeps money in circulation and keeps it constantly at work for the benefit of all.

* * * *

Aside from these material factors in our prosperity, however, there is one less tangible, but which undoubtedly has contributed much to the present satisfactory conditions. That is the spirit of cooperation, of greater friendliness, that students of business say is making itself felt in commercial affairs today. There is no doubt it has had a big influence in maintaining peace between capital and labor, for both industrial managers and trade union leaders now realize that both can succeed better by recognizing a human brotherhood than by trying to cut each other's throats.

The same holds true in general business. Cooperation and the "live and let live" principle accomplish more than the old "dog eat dog" policy. We are a long way from the millenium, of course, but the Golden Rule is being recognized more today than ever before, and who shall say it has not been an important factor in bringing about and maintaining American prosperity?

Other countries have sent delegations of trades unionists, business executives and public officials to this country to investigate conditions and find out for themselves why American business is so far ahead of their own. Invariably they have expressed astonishment at the spirit of cooperation they discovered as existing among all classes. Furthermore, they have declared the belief that it is this spirit which makes big production, high wages, and, in short, prosperity.

And if this trend towards cooperation and good will in business relations has been a factor in establishing prosperity, wisdom certainly dictates that the movement be continued and its scope enlarged.

The telephone business needs more cooperation among its various units. Every service company should join the telephone association in its own state and actively cooperate in the work of advancing the interests of the industry. There should be closer contact between the state associations and the United States Independent Telephone Association, which has done excellent service for telephony in a broad, national way, but which could materially extend its usefulness if there were closer cooperation with the state units.

There also should be better cooperation between the Independent and Bell groups. Recent conferences between their representatives are said to have been useful in clearing up matters that might have led to misunderstandings, and the feeling is general that these meetings should be continued. In many ways the two groups are interdependent on each other, and can best meet their public problems by dealing fairly with all the interests involved and by working together.

* * * *

A writer in a financial journal recently laid emphasis on the statement that because of the interdependence of industries in this age, holders of securities in prosperous concerns can no longer lay them away and forget them, relying on their always continuing to pay dividends. Industrial changes come too rapidly now, and the sudden growth of one industry may mean the decline of another business, or the greater expansion and increased

success of still another. The writer cited the tremendous development of the automobile industry which caused the decay of the carriage, harness and horseshoe lines, but made the business of concerns handling rubber, copper, paint and other automobile materials grow by leaps and bounds.

"The radio," says this writer, "is an illustration not only of extremely rapid growth but of the difficulty of foretelling just what industry will be adversely affected by a new commodity or service. When Marconi's British patents were taken out, it was generally believed that the chief threat of wireless was against the telegraph and the telephone, and no one thought of it as a competitor of the phonograph. We know now that the extensive substitution of radio transmission for telephone wires is unlikely because of the limited number of wave lengths available, and that, on the other hand, radio came within an ace of driving the phonograph to the scrap-heap."

* * * *

The statement is made in the same article that the phonograph business survived radio competition and is again prospering because of revolutionary changes made in the methods of recording and reproducing. These changes, the writer says, were the results of development and research work in telephone laboratories.

COMING CONVENTIONS.

South Dakota, Sioux Falls, Cataract Hotel, January 11, 12 and 13.

Minnesota, St. Paul, St. Francis Hotel, January 25, 26 and 27.

Nebraska, Lincoln, Lincoln Hotel, February 15, 16 and 17.

North Dakota, March 8, 9 and 10.

Oklahoma, Oklahoma City, Huckins Hotel, March 8, 9 and 10.

Texas, Fort Worth, Texas Hotel, March 15, 16, 17 and 18.

Kansas, Manhattan, April 5, 6 and 7.

Ohio, Columbus, Neil House, April 27, 28 and 29.

New York, Rochester, Powers Hotel, May 25, 26 and 27.

Government operation of public utilities is a subject that politicians like to talk about every so often, but whenever practical business men consider it they shake their heads and say it won't work out. In the Chicago mayoralty campaign, that is just opening up, home rule for utilities is being revived as an issue, which indicates that the politicians still believe it is a popular thing to advocate that the people should run their street car, electric, gas and telephone systems.

The present federal tax situation ought to be enough to show how difficult it is for politics and business to mix very successfully. Look at the facts relating to federal taxes:

The government treasury is piling up a big surplus because high taxes are continued and an economical adminstration at Washington is keeping its budget down. The President and the Secretary of the Treasury recommended a tax refund to give the surplus back to the people, which would have made business men feel more comfortable and helped conditions generally. The politicians in Congress, however, could not agree on a plan, each side fearing the other would get the credit, so there will be no relief to taxpayers, and the government will continue to collect more taxes than it needs to meet current expenses. That is not only glaring inefficiency but a stupid disregard of a square deal to the taxpayers.

It is true that the surplus is to be used to retire part of the national debt, but the present generation of taxpayers favors letting future generations do their share also.

When politics prevents the declaration of a dividend—and that is what a tax credit would be—and insists on piling up an unnecessary, large surplus, it admits a lack of business ability that strengthens the belief that the public would get little benefit from government operation of commercial enterprises, especially service companies—that require good management.

Economics of Telephone Service

Supply and Use of the Service from an Economist's Viewpoint—Telephone Companies Must Compete with All Business Enterprises—Paper Presented at Annual Convention of the Illinois Independent Telephone Association

By Horace M. Gray, Ph. D.

Department of Economics, University of Illinois

It is indeed a propitious occasion when members of the staff of the University of Illinois are invited to appear before representatives of the telephone industry of the state to discuss the problems of your business. Such a meeting brings together in pleasant association two of the greatest institutions of our commonwealth.

One of these institutions, the telephone industry, by its mechanical improvements and its skill in business organization has succeeded in bridging the gulfs of time and distance—throughout the ages two of the greatest obstacles to the advancement of human civilization.

The other, the University, through the painstaking research of its staff and by the teaching and guidance of the young people of the state, has kept alive the flame of learning on the prairies of Illinois and has been instrumental in raising the cultural level of our citizenship from the rudeness of pioneer days to the present plane. It is of public significance, therefore, that these two instruments of civilization should be mutually interested in one another.

The College of Commerce of the University has, within the last three years, instituted courses in the economics of public utilities. These courses are designed to embrace a study of all the major utilities in their many ramifications in such a way as to either prepare young men to enter into the utility industries or, as citizens, to have a better understanding of the utilities and their problems.

It is not to be presumed that one whose activities lie outside the field of active management of telephone properties should engage to discuss the more detailed and ofttimes technical operations that make up your daily routine. The economist is like unto a trained observer who stands at a detached observation post and views the myriad economic forces, marching and counter-marching on the field of business.

He notes the formations of these forces, their relative strengths, their rates of progress, and their general movement. Out

of all these observations he deduces certain rules of action from which predictable results may be expected to follow. It is from this detached post of observation, therefore, that I wish to note some of the present movements of economic forces as they affect the telephone utility.

For the last 20 years, since America has been slowly but surely changing from an agricultural nation to an urbanized industrial nation, it has been a tradition that the telephone business, unlike some other utilities, is subject to the law of increasing costs. That is to say, as the business expanded and more subscribers were added, more than proportionate amounts of capital and labor were required to provide the service for each added customer. As a result of this tendency, the cost of furnishing service per customer tended to increase.

This tendency has been explained customarily on the ground that as new subscribers were added new and longer lines were necessary, greatly enlarged exchange facilities were required to connect the new customers with all other customers, and more labor was required to effect the connection between the new customer and every other customer.

This tendency toward increasing costs has been demonstrated so many times in both theory and practice that it is hardly worth while to undertake here a detailed analysis of this problem. Practical telephone men should be concerned, not so much with the existence of this law, but rather how to combat it; how to reduce costs to postpone as long as possible the blighting effect of increasing costs.

Unless this be done, it is conceivable that future expansion of telephone facilities may entail such burdensome charges that the consuming public cannot, or will not, be willing to bear the increased cost. In that event expansion would be cut short and the telephone utility would be unable to perform the high economic function of which it is capable. How, then, may the telephone industry overcome the retarding effect of increasing costs?

The following possibilities seem to offer a feasible means of counteracting the tendency toward increasing costs:

1. Continuation of mechanical invention and technical improvements. The introduction of new mechanical devices for the transmission of speech and for making connection has already wrought wonders in the telephone industry. There is no indication that American inventive genius has reached the limits of its resourcefulness.

2. Constant research in the fields of customer demand, load conditions, traffic control, and exchange improvements, with the view of reducing the cost per call. Much has been done in these lines, but, sad to say, research of this nature has been conducted by, and the benefits have for the most part accrued to, companies operating in large metropolitan centers. All too little work of this kind has been done in the smaller companies operating in semi-rural communities.

3. Continued substitution of capital for labor in small cases where a comparison of the relative costs involved would indicate that such a substitution would result in a reduction of costs. This process has been in progress for several years in the telephone business, particularly in installing mechanical switching apparatus. Inasmuch as present conditions seem to indicate that for some time to come labor will be expensive and capital increasingly cheaper, it is not unreasonable to suppose that the telephone industry will find, as other industries are finding, new and profitable opportunities for such substitution.

4. Further interconnection and consolidation of operating properties where it would appear that such interconnection might result in the elimination of certain duplications of investment and operating personnel. Both Bell companies and Independent companies have done much in this direction but much still remains to be done, especially in the smaller communities.

5. Collection and study of data on the influence of the rate structure upon operating costs in certain communities. It has been shown that under a flat-rate system some subscribers make excessive use of their telephones at certain busy hours of the day, whereas under measured or pay-for-what-you-use rate system many of these useless calls are eliminated.

It might even be possible to introduce off-peak rates somewhat after the fashion of the gas and electric companies. Such possibilities, while perhaps far fetched at present, may eventually be necessary in order to reduce the costs entailed by excessive peak-load conditions.

The foregoing suggestions are introduced here not as final solutions for the great problem of reducing costs but as thought-provoking instances of possible lines of approach to the general problem. The importance of reducing costs by every means avaliable cannot be too much stressed in an industry that admittedly operates under the law of increasing costs.

I was reading recently an appeal directed to the Ohio legislature in 1908 by representatives of the Independent telephone companies in which they set forth at great length the advantages which would accrue to the telephone business from the presence of competition. They also spoke in doleful accents of the evils that would plague society if monopoly should ever gain a foothold in the telephone industry.

In strange contrast, however, to these views of 1908 we now find men high in the ranks of the Independent telephone association proclaiming that the elimination of competition has been a godsend to the telephone business. They plead for better productive cooperation among all classes of telephone companies, for interconnection, and for working agreements.

It has thus been a far cry from the devastating competition of former days to the productive cooperation of today. The economist may, therefore, well praise the telephone operators that they have given over the bitter competition of yesterday for the harmony of today.

It occurs to me, however, that we are inclined to use the word competition in too narrow a sense. When we say that telephone companies no longer compete in the same locality, we are inclined to dismiss the thought of competition completely from our minds. To do so seems to me to lose sight of the broader meaning of economic competition. Although telephone companies no longer war with one another, they still carry on economic competition with the world at large.

A telephone company must compete with every other business enterprise for the use of land, labor, capital, and managerial ability. It must purchase these factors of production in an open, competitive market, bidding against all comers. Moreover, because of its public obligation to expand, a telephone company must go to market at times when it might much prefer to stay at home—that is, when the level of prices is such that the better part of wisdom would be to refrain from purchasing.

THE GREATEST SINGLE THING.

What is the greatest single thing in the character of a successful enterprise, in the character of a boy, in the character of a great baseball player?

I think it is the desire to be a great baseball player, a desire that dominates him, a desire that is so strong that it does not admit of anything that runs counter to it, a desire to excel that so confines him to a single purpose that nothing else matters.

That thing makes men come in at night, that makes men have good health, that makes men change their bad technique to good technique, that makes capacity and ability in men. That makes a team with 80 per cent possibility come from 60 to 70 per cent, that makes them approach their possibility; and with a dominant desire to excel, that simply transcends them into a great spiritual force.

The greatest single thing in the qualification of a great player, a great team, or a great man, is a desire to reach the objective that admits of no interference anywhere. That is the greatest thing I know about baseball or anything else.
—Branch Rickey, vice-president and general manager, St. Louis "Cardinals" Baseball Team, in address before Executives' Club of Chicago.

Besides bidding against the world at large for the factors of production, a telephone company, like every other enterprise, must contend against all other businesses for a share of the consumers purchasing power. Any individual ordinarily is possessed of a certain rather stable income of purchasing power, and it is to his economic advantage to so dispose of this purchasing power as to secure the greatest total satisfaction of his wants. The danger here lies that the individual may, in the distribution of his income, forget his need for and the desirability of telephone service, in which event the telephone company will not be the recipient of its fair share of this purchasing power.

Hence arises the necessity for the varied commercial activities of a telephone company. No company can afford to disregard the commercial side of its business, for to do so is to fall behind in the great procession of economic life. It would seem that a telephone operator must consider the meaning of the competition in its broadest sense. While the telephone business is no longer beset with civil strife among constituent companies, it must still face the never-ending competition for the factors of production and for its fair share of the consumers' purchasing power.

The all-absorbing problem of rates may be considered under two heads, namely, the general level of rates and the rate structure.

It is generally conceded that the general level of rates should be such as to produce a fair return on the property used in the public service. Acting upon this principle telephone operators, especially in some of the smaller companies, are now insisting on higher rates. This view is in strong contrast to that expressed by leaders in the gas and electric utilities, who have been saying for some time that the only way to develop these services is to reduce rates as fast as is consistent with a fair return on the investment.

The contrast is still more unfavorable to telephone companies because the insistence on higher telephone rates comes mostly from the smaller companies operating in the communities where the electric companies, for example, are making rapid progress toward lower rates. The telephone man is thus, by comparison, placed in a bad light and is hard put to justify his position.

Rate Policy Differences

This divergence in rate policy as between the electric and telephone utilities may in part be explained by different operating laws. It may be said that the electric companies are now reaping the advantages of decreasing costs brought about by extensive interconnections and some consolidations, whereas the telephone company by the nature of its operations works under the disadvantage of increasing costs.

To the extent that these different operating conditions are true, the telephone company can justify an increase in its rates while at the same time the electric company is lowering its rates in the same community. To the extent, however, that the difference in rate policy may be due to slowing up of mechanical improvements, to lack of cooperation, to inefficiency on the part of management, or to unwise financial administration, it is impossible to present a satisfying justification.

It is, therefore, to the interest of the telephone industry to avoid unfavorable comparisons with other types of utilities by giving particular attention to problems of operating efficiency and sound public policy.

Rate Making a Relative Matter.

The general level of rates is, in a broad sense, a relative matter. There is no such thing as a fixed and immutable level of rates. Like all other prices in economic life, the price of telephone service cannot, over a long period, move contrary to the general price trend of other commodities. Regulation to the contrary notwithstanding, telephone rates will eventually move in conformity with the great cyclical price swings.

It is generally recognized among statisticians that from 1896 to 1923,with short recessions in such years as 1901, 1903, 1907, 1914, and 1920-21 the general movement of prices has been upward. It now appears to a considerable number of qualified observers that since 1923 there has been a slight downward movement of prices. If past history is acceptable as a basis of judgment, it seems reasonable to infer that the country may be entering a period of declining prices.

In view of these possibilities it is, therefore, of vital concern to telephone operators to inquire closely into the logical position of their claim for higher rates. If it is true that telephone rates cannot move contrary to general price tendencies, and if it is also true that the next price movement is likely to be downward, then it would seem overly optimistic to entertain hopes for any very important increases in telephone rates.

On the other hand, the many possibilities which are open for reducing costs may make such increases unnecessary. The same attention to perfecting operating economics that has wrought such wonders in the railroad business may lie just ahead for the telephone utility.

Of equal importance with the general level of rates is the problem of the proper classification and differentiation of rates.

In a very simple community life, where the people are all engaged in the same or closely related occupations, where they all use telephone service in approximately the same quantity and at well distributed time intervals, where the telephone company offers but one uniform class of service, and where all the subscribers live and work within approximately the same distance from the central exchange, it is practical and equitable to levy a flat, uniform charge against all subscribers. It is manifest, however, that these simple conditions cannot and will not long prevail in any but the most unprogressive communities.

It is a truism to say that economic progress involves division of labor, increased variety of economic, social, and political activities, and concentration of activity in certain strategic centers. It is also true, although perhaps regrettable, that our competitive system of economics tends to produce inequalities in purchasing power. This is to say, some, by dint of greater skill or greater industry, are able to secure a large portion of the social income, while others less fortunate or less industrious receive a smaller share. This last fact gives rise to greater ability to pay on the part of some than on the part of others.

The simple community life will, therefore, tend to become more complex. Many different business and social activities will arise, all delicately inter-related by the existing lines of communication. Some persons will find it necessary to make more calls than others, and many will insist on making their calls at the same time in the day. Some will find the standard service inadequate for their needs and will insist on better service, special equipment, and private lines.

Some will be located near the central exchange, others at remote distances. Some will use telephone service as a means of conducting business, others as a social convenience. Some will have ability to pay for the best grade of service, while others can barely afford the service, even of the poorest grade. Still others will be, or think themselves, unable to afford any telephone service.

Uniform Flat Rate Unthinkable.

It is manifest that a flat, uniform rate is unthinkable under these complex conditions. From a company point of view, it is a hindrance to expansion, it is uneconomical, and a source of endless conflicts with irate subscribers. From the public point of view, the flat-rate system is unequitable as among subscribers and not conducive to good service. A measured or pay-for-what-you-use rate, on the other hand, is the true economic type of rate.

Under such a rate each subscriber receives a quality and quantity of service commensurate with his needs and in accordance with his ability to pay. A measured rate, moreover, makes possible the establishment of some relationship between the quantity of service used by any one subscriber and the cost of producing that given quantity of service.

I have not at hand data sufficiently accurate to warrant a conclusion as to how many telephone companies in Illinois have some kind of measured class rates and how many still adhere to the flat-rate system. It seems inevitable, however, that as

our business life becomes more complex, we must, in the interest of sound economy, even in many of our smaller communities, adopt some kind of measured class rates.

The telephone industry, on the whole, has been slower than some other utilities to introduce differentiated class rates based on the quantity of service used. The gas and electric utilities owe much of their progress to the abandonment of flat rates in favor of differentiated class rates based on use. The history of railroad rates is a continuous progress of elaboration of the differentiation principle. On the other hand, street railway companies have been restrained by political pressure from using differentiated rates, much to their disadvantage.

The success of large metropolitan telephone companies in adopting this principle would seem to indicate that it is practical and might, with proper modifications to fit the circumstances, be used in small telephone companies.

The tendency, as noted, toward the establishment of different classes of service brings us face to face with a bitterly contested point in rate theory. It is generally assumed that an utility should produce its service at cost, including in cost a fair return on the property used in the public service. This proposition, however simple it may at first appear, is difficult of application to individual cases.

When a telephone company produces one class of service for a homogeneous group of customers, it is easy to apportion the total cost among a given number of patrons. Let, however, this company undertake to produce several classes of service under widely different conditions; it then becomes impossible to apportion exactly the costs among subscribers. Many of the charges are continuous, whether or not the telephone is used. Many of the costs are for the service as a whole and have no direct relationship to the number of calls made by any one patron.

As a practical alternative the telephone company is forced to apportion the costs as equitably as it can, using as a final determinant the value of the service to the customer. By such a method each customer pays the known costs arising from his use of the service plus some contribution toward the unknown or joint costs arising from the business as a whole. The size of this last contribution will necessarily depend on the value of the service to the customer.

The foregoing use of the value of service principles has been bitterly opposed by

(*Please turn to page* 42.)

News of Great Britain's Telephones

Items of Interest Concerning Telephone Developments and Problems—Loss on Rural Telephones—Growth of Telephones in Irish Free State—Report of the Only Municipal Service in England Shows Profit for Half Year

By "Telephony's" Special Correspondent

During a discussion with the agricultural committee of the House of Commons on the question of providing more telephones in rural areas, the Postmaster General said that he was disappointed with the response his "forward" policy had received.

Rural exchanges, which now numbered 820, caused a direct loss, he said, of £42,186 a year. Fifteen subscribers would put each exchange on a paying basis, while the minimum of eight subscribers necessary before a rural exchange could be established involved a loss to the taxpayer.

One of the results of a nationalized service is that, from its nature, it can hardly be flexible or willing to take the risks that are accepted as ordinary business risks by private companies.

Historic Mansion for Exchange.

Harrington House, in Craig's Court, Charing Cross, closely associated with the history of the famous Stanhope family, is the proposed site for the new automatic exchange for the West Central district.

The mansion dates from 1702, and has an imposing facade and doorway in the court which, it is hoped, may remain under the scheme. It also contains a very fine staircase and a good deal of panelling.

It has a close connection with the famous South Sea Bubble. Charles Stanhope was accused of taking advantage of his position as secretary of the treasury to gamble in South Sea stock, and was said to have made some £250,000. The allegation was not proved and, with Walpole's interest backing him, Stanhope was acquitted.

Wireless Telephone for Clyde Island.

The Clyde lighthouse's trustees at a meeting in Glasgow have decided to proceed with the installation of a wireless telephone apparatus in the lighthouse on the Little Cumbrae, an island beauty spot on the River Clyde.

The house of the proprietor of the island is connected with the mainland by telephone cable, and an alternative was suggested that the trust might share the cost of the cable and expenditure on repairs. The trust engineers, however, reported that the wireless installation would be cheaper.

In place of the continuous call bell system it is proposed to fit clocks that will automatically switch in the call bell every half-hour.

Development in Irish Free State.

The Saorstat telephone service has now been carried into all of the 26 counties of the Irish Free State. In 1922, when the service was taken over from the British Post Office, there were 19,076 telephones in connection with it. Today there are 24,239—an increase of 27 per cent. In the same period the number of miles of wire in use rose from 41,880 to 70,450, or nearly 68 per cent, indicating the gratifying fact that the increase has not been concentrated in urban areas.

It is now possible to talk from Dublin to Sligo, Carrigaholt and Skibbereen, and when present plans are complete farthest Mishowen will be linked to remote Rosscarbery. No provision for contact with the herring fisheries of northwest Donegal has yet been made.

A Post Office Innovation.

It is proposed in the new year to institute a system here, whereby, within reasonable limits, people who ring up a subscriber on the telephone and can obtain no reply may, if they wish, have their names and addresses given to the absent subscriber after his return.

The Post Office suggests that a period, such as a summer holiday or indeed any period longer than three or four days, be regarded as outside reasonable limits.

Sample-Showing by Television?

John Dickens, in an address to the Northampton Business Men's Association, suggested that television in conjunction with the telephone might eliminate the commercial traveler. Manufacturers and merchants would be able to exhibit their samples by television while they sold them by telephone.

The suggestion is intriguing, but no doubt the commercial traveler will hold his job for some time yet.

Profitable Municipal Telephones.

The half-yearly statement of income and expenditure presented at the meeting of the Hull Corporation telephones committee showed a surplus for the half year of £5,752.

The chairman said that he expected the full year to yield a profit of approximately £10,000.

Hull is the only municipality in England that now runs its own telephones.

Automatic Telephone Fundamentals

This Is One of Series of Articles Explaining in Simple Terms the Mechanical and Electrical Basis of the Strowger Automatic Telephone System, Which Will Appear Each Week in TELEPHONY—Part 2, the 100-Line Automatic System

By Arthur Bessey Smith, Ph. D.

In order to connect 100 telephone lines, it is only necessary to supply each telephone line with a connector similar to the one described in Part 1 in last week's issue. We may define a connector as follows:

A connector is an automatic switch which has the ability to connect its line and wipers with any one of 100 lines. Of course, connectors have been made with more or less than 100 lines in the bank, but most of the connectors now made are of the 100-line size.

The skeleton of a 100-line system is shown in Fig. 6. In the upper left hand corner are shown three telephones, which may be taken to represent a complete 100-line system.

Instead of drawing two lines to represent two wires belonging to each telephone, we shall ask the reader to imagine the one line as representing as many wires as are necessary for a circuit; also to imagine each little circle to represent one contact, two contacts, or as many contacts as are necessary to complete the circuit.

This bit of electrical shorthand will enable us to condense our diagrams into smaller space and render them easily understood.

Each telephone is provided with its own connector, the latter located in the central office. The short space between the telephones, (14, 87, 95) and the first tap taken from the lines are supposed to represent the line wires extending from the subscriber's premises to the central office.

Line No. 14 proceeds from the telephone to the central office and terminates in the wipers of connector No. 14. Line No. 14 is also multipled to contact No. 14 in all of the connector banks. Line No. 87 terminates in the wiper of connector No. 87 and is likewise multipled to its appropriate contact No. 87 of the connector banks.

The system as thus described is a full multiple switchboard. Each connector switch may be likened to an operator whose duty it is to care for the calls originated by a single line. This mechanical operator has before it multiple terminals for all the lines in the office.

If subscriber No. 87 desires to connect with subscriber No. 95, the procedure will be as follows:

Subscriber No. 87 will take the receiver from the hook and send nine impulses over the line. This will lift the wipers of connector No. 87 to the ninth level. The subscriber will then send five impulses which will rotate the wipers on connector No. 87 until they touch contact No. 5 in the ninth level. This completes the circuit for telephone No. 95.

The connector switch has a number of duties devolving upon it. The chief of its duties are as follows:

The busy test.

The ringing of the called line.

The supplying of talking current to both telephones.

The release.

The busy test involves two parts, a lock and a signal; the lock is the prevention of intrusion on the called line if it is busy. The signal is the tone or other indication to inform the calling subscriber that the called line is busy.

The supply of taking current is furnished through the line relays as are shown in Fig. 1 of Part 1.

An interesting feature of the busy test is the ability to obtain a busy tone when the subscriber calls his own number. The mere act of taking the receiver from the hook causes the busy protection to be placed upon his line, so that any other subscriber calling him will be unable to connect.

Consequently, when the subscriber calls his own number, he will get the same busy test and in the same manner that anyone else would get it. It may be likened to an office man hanging a card on his front door, locking it, going out the back door, walking around and going up to his own front door, only to find it locked.

It is evident that it is possible to make an automatic system larger than 100 lines on the full multiple plan just described. It would involve the construction of switches having as many bank contacts as there are lines in the exchange. Switches have been made and successfully operated with as many as 200 lines. A 400-line switch was made experimentally and tested out. A switch having a capacity of 1,000 lines has been designed, but as far as known to the writer never used in practice.

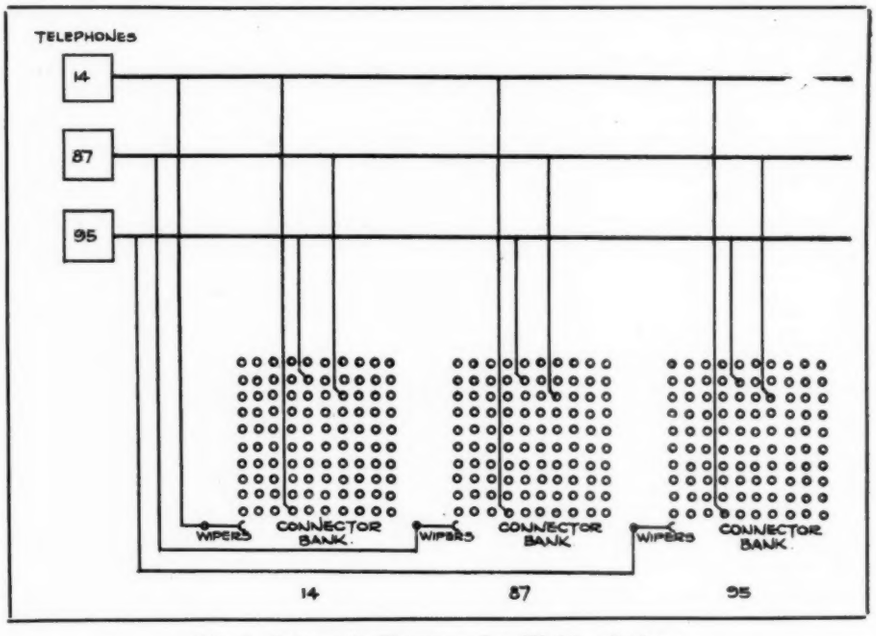

Fig. 6. Schematic Diagram of a 100-Line System.

The full multiple system would be very wasteful on account of high first cost and maintenance. The switches would be bulky and unwieldy and on the whole totally unsuited for the purpose of giving high-grade service.

Some system of grouping is necessary in order to permit the exchange to serve a large number of subscribers by means of small compact switches. We may, for instance, divide the subscriber's lines into groups of 100 each, and arrange our switches first to choose the group, and then to connect with the desired line in that group.

For the purpose of illustrating the trunking system employed by the Strowger automatic system a brief review of the manual transfer board and inter-office

trunking will be of great assistance. The transfer board was the first step in the enlargement of the simple manual board. It was abandoned in favor of the multiple board, but the principles involved have been revived and used successfully with automatic switches.

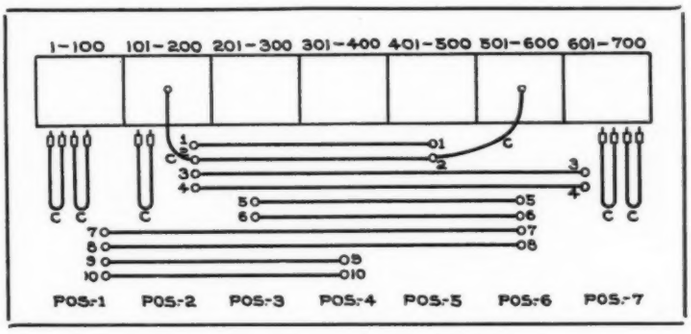

Fig. 7. Multiple Transfer Switchboard.

The reason for the failure of the manual transfer board is found in the weakness of the link connecting the transfer lines, i. e., the human operator. The success of the transfer system in the automatic switchboard is to be found in the perfection of that same connecting link by making it fully mechanical and, therefore, free from the weakness inherent to human operating.

In the manual transfer board shown schematically in Fig. 7, each square represents the line jacks and signals for 100 lines. Each of the seven operators answers calls for 100 lines, completing locally all the connections which may be within her reach.

When a call is received for a line terminating on a distant part of the board, she must extend the circuit by means of a transfer line, as is shown between positions Nos. 2 and 6. The connecting cord, *C*, at position No. 2 is shown inserted in a line jack and the other end to a transfer line to position No. 6. The other end of transfer line 2 is connected through cord *C*, to the called subscriber's line.

We may classify the two operators concerned in a connection according to the order in which they perform their work. We may call the operator who answers the call the "primary operator" and the one completing it the "secondary operator." On the transfer board all operators act in both capacities.

Manual inter-office trunking also employs operators in the primary and secondary relation. In Fig. 8 are four offices each provided with a full multiple switchboard. The square marked "ANS" is the multiple before the "A" operators whose duty is to answer calls originating in the office and as far as possible to complete them in the multiple before them. The rectangle marked "B" is a multiple of the same lines.

All calls which are received by "A" operators and are destined for other offices are connected by the "A" operator through one of the trunk jacks to the "B" operator in the distant office. It is the sole duty of this "B" operator to complete incoming connections.

The "A" operators are "primary operators," and their first duty is that of office choosing. The "B" operators are "secondary operators" only and distribute the calls coming into their boards.

Modern practice often reduces "A" operators to primary switching only, even for local calls. In large multi-office exchanges, the percentage of calls trunked out of each office is very great, often rising to 80 per cent or 90 per cent. In this case it does not pay to install a complete subscriber's multiple for "A" operators; hence it is taken away and the entire work of completing connections is left to the "B" operators as will be described.

The "A" operators (Fig. 8) receive calls from the subscribers' lines on certain answering jacks and lamps denoted by "Ans." In front of the "A" operators are trunk jacks numbered "1," "2," "3," "4," leading to the several offices. After the call has been given, the line will be plugged into the trunk line which terminates on the trunk plug in front of the "B" operator in the distant office. This "B" operator will then complete the connection by inserting a trunk plug into the multiple jack of the desired line.

The "A" operator has thus been reduced to the office of "group chooser" and may be called the "primary switch" or more correctly "selector switch." The "B" operator may be called the "secondary switch," or better, "connector switch." If we replace each human operator by a mechanical switch, we have a close likeness to the automatic exchange arrangement.

Although Fig. 8 shows but one trunk line leading from one office to another, it must be understood that as many trunk lines will be provided as are necessary to carry the traffic. These trunk lines will be grouped on the "A" board in such a manner that an "A" operator will know that the trunks in a certain group lead to a certain office. She has only to choose the group of trunks and then be sure to take an idle trunk in that group.

Although in practice the trunk is assigned by the "B" operator and this number passed to the "A" operator over an order wire, the "A" operator could, by making a busy test, discover for herself which trunk of any group is idle. The "B" operator assigns the trunk because of the slowness of the "A" operator in testing. If we provide automatic switches which can test from 10 to 20 trunks in one second, we shall gain very materially by allowing the primary switch to find the idle trunk for itself. (*To be continued.*)

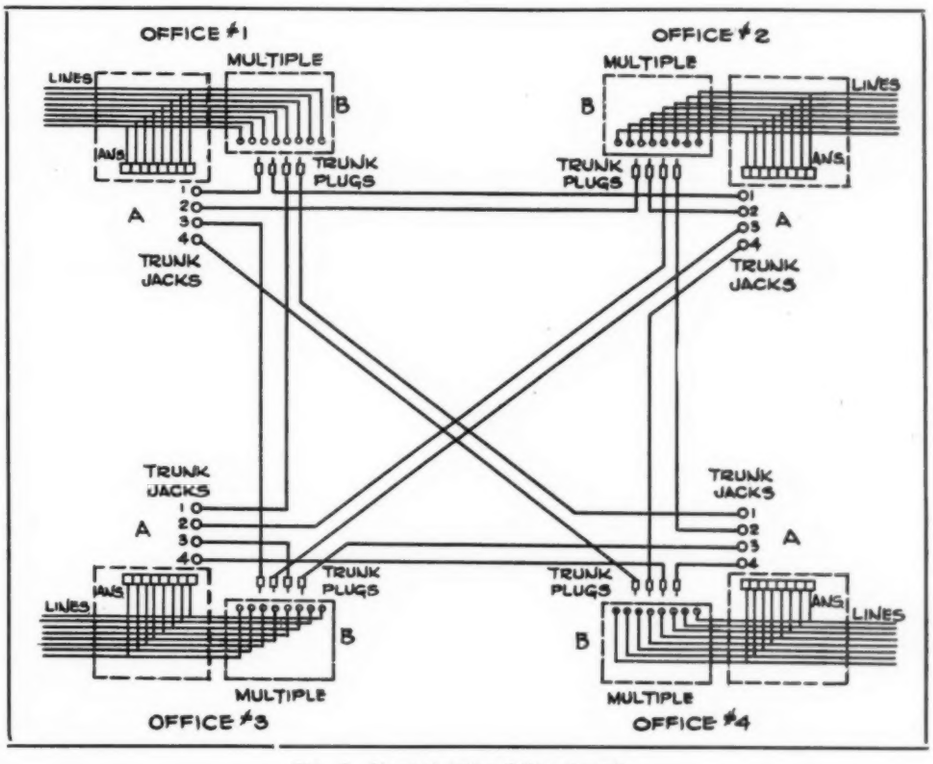

Fig. 8. Manual Inter-Office Trunks.

Constructive Telephone Financing

A New Year's Message to Independent Company Owners on Today's Real Opportunity—Permanent Financial Structure Advocated While Time Is Favorable; a Structure That Will Permit of Future Growth and Extensions

By R. F. DeVoe,
President, R. F. DeVoe & Co., New York City

Many important developments have occurred during the past year in the Independent telephone field. A number of properties have changed hands; in fact, the turnover has undoubtedly been heavier than at any time in the history of the business.

A large part of the financing necessary to purchase these telephone properties has been obtained from the public security markets, and Wall street now follows with a great deal of interest, the flotation of securities of Independent telephone companies.

Money for the past two years has been plentiful and indications point to continued easy conditions for the coming year. The next 12 months should, therefore, afford the owners of Independent telephone companies, an unusual opportunity to put their "houses in order."

I have followed with a great deal of interest and have heartily endorsed the efforts made by TELEPHONY and the United States Independent Telephone Association to prevent the exploitation of telephone companies which might overnight, injure the credit of the entire business as a whole, create unhealthy public relations with the community served, and lastly, directly burden all companies with protective legislation and unnecessary additional commission regulation.

All recent meetings of your national and state associations have struck a keynote of "Conservative Financing," but the discussion has largely dealt with the negative features—the over-valuation of property and the over-issuance of securities. As yet the constructive feature has not been thoroughly advanced, and it is my intention to outline in a few words the opportunity which now exists to set up sound financial structures which will enable owners to obtain the maximum return from property and anticipate all future requirements.

The money market will now absorb a large volume of first mortgage public utility bonds issued under conservative restrictions embodying the so-called "open-

I.		II.		III.	
	Per cent of capital		Per cent of capital		Per cent of capital
$1,200,000 (5½ per cent) first mortgage bonds	40	No bonds.		No bonds	
$900,000 (7 per cent) preferred stock	30	$2,000,000 (7 per cent) preferred stock	66⅔	No preferred stock.	
$900,000 common stock	30	$1,000,000, common stock	33⅓	$3,000,000 common stock	100
Net earnings	$300,000.00	Net earnings	$300.000.00	Net earnings	$300,000.00
Bond interest	66,000.00				
	$234,000.00				
Taxes	$ 29,250.00	Taxes	$ 37,500.00	Taxes	$ 37,500.00
	$204,750.00		$262,500.00		$262,500.00
Preferred stock dividends	$ 63,000.00	Preferred stock dividends	$140,000.00	No preferred	
	$141,750.00		$122,500.00		
Earned per share, common stock	$ 15.75	Earned per share, common stock	$ 12.20	Earned per share, common stock	$ 8.75
1. Allows for open-mortgage-low-interest-rate bond issue.		1. Does not permit expansion of any size as additional bonds would reduce the earnings available for preferred dividends to a point where preferred market value would be severely injured.		1. Possibility for financing through bond issues or preferred stock.	
2. Allows for preferred stock issue which may be sold to subscribers—of sufficient size to have marketability.		2. No additional preferred stock can be isued, as earnings are insufficient to meet further dividends.		2. No income tax advantage.	
3. Shows $15.75 per share to common stockholder.		3. A high income tax is paid annually.		3. Return on common stock only $8.75 per share.	
4. Large security buyer and community served hold 70 per cent of company capitalization.		4. The return to common stock is $12.20 per share. Any additional common would reduce common return per share.		4. Common stockholder carries 100 per cent of business risk.	
5. Growth is possible through financing of either bonds, preferred stock, or common stock.		5. No national distribution; hence the company would be a weak borrower in time of stringency in money market.		5. No advantage of low money obtainable today.	
6. Structure most favored by investors and commissions.				6. No national market to create marketability.	
7. Company becomes nationally known; hence market is not limited.					

Comparisons to Illustrate Different Financial Structures and the Results Which Each Produce.

end" mortgage. This type of mortgage enables a company to issue bonds of various series from time to time for additions to property, betterments, acquisitions, etc., carrying coupon rates and maturities adapted to market conditions at the time of issue.

The present bond market will take long maturities, preferably 20 to 40 years, thereby deferring debt charges over an extended period, and relieving the problem of continued borrowing. Bond interest is incidentally deducted from net earnings before payment of federal income taxes which means that a company with bonded debt has a material saving as against an unfunded situation. This is strikingly illustrated later in a comparison of three typical companies.

Another broad market has arisen for preferred stock of operating companies which are not overburdened with bond debt and have a reasonable cushion of common stock equity. Investors, as a rule, prefer a capital structure of 40 per cent bonded debt, 30 per cent preferred stock, and 30 per cent common stock, and, of course, desire the total capitalization to parallel the property valuation approved by commissions for rate-making purposes.

This is particularly true of the large institutional investors. The average investor, therefore, seeks a preferred stock which shows a two to one equity, and earnings after bond interest, depreciation and taxes equivalent to at least two times dividend requirements.

While this market for preferred stock is a great source of capital, its value at present to Independent telephone companies is not as important as local community distribution and ownership. The value of the latter has already been recognized by the largest public utility companies that have already completed subscriber ownership campaigns. Distribution of this type has one possible boomerang which must be anticipated. It is that the security sold to the public served must have reasonable marketability.

It is presumed that no company would issue in its community, inferior security or inadequate yield—but remember that today is a time of easy money and when money conditions change and security prices readjust themselves to new conditions, the investor is too prone to look with disfavor upon the distributor of a security depreciated in price, even though the company's financial position is unchanged.

The investor also shudders when there is no general market for his securities—especially if money is urgently required—for if there is no market, the average bank will not make a collateral loan.

The answer to the problem is to be certain that securities issued direct through company sponsorship are priced, if anything, slightly under the general market; (2) that community banks are approached on definite loaning ratios; and (3) that either a local group or a reliable banking firm be engaged to maintain marketability.

A telephone company should not be asked to tie up its working capital in its own securities or to enter into the hazardous business of trading in securities.

The real opportunity today for owners of Independent telephone companies is the proper consolidation of adjoining or neighboring properties into systems of 15,000 to 25,000 stations, for the purpose of not only effecting plant and management economies but with the idea of creating a permanent financial structure while the time is favorable; a structure which will permit future growth and extensions under all conditions, while the interest rates are the lowest in the history of Independent telephone company financing and while the possibility of establishing broad marketability has never been exceeded.

For the purpose of study, I am developing a comparison of three typical capital structures. I am assuming in each case a company of 25,000 stations earning approximately $12 net annually per station and valued at $120 per station.

Another aspect of the consolidation of properties in satisfactory units, is the opportunity to eliminate old-type burdensome mortgages which are entirely inadequate today and which, in many cases, are impairing growth and progress. A comparison of outstanding mortgages with the present type would be a revelation to the average property owner.

The modern open-end mortgage is the result of years of legal experience and, in addition to being protective to the company and the investor, is also anticipatory. It is flexible enough to meet almost any condition.

The readjustment of smaller companies into a unified system permits creation of a modern standard accounting system thoroughly in harmony with commission requirements. The recent ruling of the Interstate Commerce Commission in regard to depreciation, places upon all telephone companies, the need for a well-trained corps and efficiency in accounting procedure.

The owner of a telephone property is thereby enabled to know his position from day to day and a rate or valuation petition then becomes a simplified process. The revaluation of properties at the present time and the creation of the basis for a perpetual inventory is another decided advantage.

Therefore, I heartily recommend for the New Year, the resolution not to let 1927 go by without serious consideration of the present opportunities.

Arrangements All Complete for South Dakota Convention.

The 21st annual convention of the South Dakota Telephone Association, to be held at the Cataract Hotel, Sioux Falls, next week on Tuesday, Wednesday and Thursday, is expected to set new standards for conventions in that state. The past year has seen greater activity than ever in the association's work, and the list of members has shown a healthy increase.

Featured on a blotter sent out to all telephone companies in the state was this little bit of conversation:

"Let me tell you Bill, you can slam the association all you want and pooh-pooh the conventions; but I want to say right here—I've met some of the best men, and absorbed some mighty valuable ideas at these meetings.

That's why I'm going again this year. You men will miss it if you don't come along."

And that is the experience of all modern progressive telephone men who make a practice of attending state and national conventions.

The program in full follows:

TUESDAY, JANUARY 11, 2:00 P. M.

Reading minutes of last convention.

Reading minutes of executive committee meetings.

Reports of Secretary-Treasurer Thos. Phalen, of Aberdeen.

Address of President W. W. Straight, of Crooks.

Reports of standing committees, by the chairman for each committee.

Appointment of convention committees.

Resolutions.

Nominations.

Discussion—Association activities.

WEDNESDAY, JANUARY 12, 9:30 A. M.

Address of Welcome, by Mayor Thomas McKinnon.

Response to Address of Welcome by W. J. Brazell, general manager, Dakota Central Telephone Co., Aberdeen.

"Inductive Interference," by L. F. Wood, Division transmission engineer, Northwestern Bell Telephone Co., Omaha, Neb.

"Exchange Construction," by O. A. Knell, plant superintendent, Tri-State Telephone & Telegraph Co., St. Paul, Minn.

"Our Traffic Problems," by W. F. Cozad, general superintendent of Traffic, Northwestern Bell Telephone Co., Omaha, Neb.

"Operating the Small Exchange," by W. J. Brazell, general manager, Dakota Central Telephone Co., Aberdeen.

Report of nominating committee and election of officers.

WEDNESDAY, 6:30 P. M.

Banquet, Entertainment, Dancing.

THURSDAY, JANUARY 13, 10:00 A. M.

Report of the committee on resolutions.

Report of the auditing committee.

"Casualty Insurance—Its Service to The Telephone Field," by Wm. D. Jackson, Lynton T. Block & Co., St. Louis, Mo.

Discussion by members or others, regarding future association activities.

Unfinished business.

Here and There in Telephone Work

Doings of the Noon Hour Club.

By J. A. Bracken.

"Happy Ed, our testman, is going to tell us something today, boys, that will interest all," said the chairman, as he sat upon an upturned cable reel that stood in the storeroom. "Ed will talk about 'insulation resistance,' and I am sure what he says will help us to better understand the necessity for performing line work strictly according to our specifications."

The chairman then turned to Ed, saying, "All right, big boy, you tell 'em."

Ed was well known to all the gang, having been long among them. He did not stand on ceremony, but began by saying: "Well boys, speaking of 'insulation resistance' reminds me of a student lineman, who one morning hailed the construction foreman with, 'Say boss, what is this dope, insulation resistance, I hear the testman talking about so often? Has it a kick?"

"No, Buddy, it hasn't," replied the foreman, "this particular kind of dope is only capable of producing a kick from the testman whenever the insulation of a line isn't up to par—and it is some kick, so be careful when stringing wire and do your stuff."

"Now fellows," continued Ed, "you know that if a transmitter is not practically perfect, it will not properly respond to speech. If a receiver hasn't a diaphram, it is useless. Likewise, the insulation of a telephone circuit that is not first-class, must be classed as worthless insofar as the proper operation of the equipment connected to it is concerned.

"In telephone practice, as you know, rubber, paper, porcelain and glass are used extensively for insulation purposes, to keep the telephone currents within the given bounds of the conductors. These insulators have a certain definite resistance known as 'insulation resistance.' That means simply the resistance of the insulating material of a covered wire or conductor to an impressed voltage tending to produce a loss or escape of current by leakage from cable conductors, line, drop, or interior wire, etc., and is the joint resistance of all the paths along which the current can leak to the earth. In the case of an open-wire line, it is the joint resistance of all the insulators to the passage of current over the surfaces.

The effect of leakage is to allow a portion of the telephonic current to escape to the earth, and thereby reduce the total amount flowing in the circuit. But a slight and well-distributed leakage in a toll or other open-wire line is an assistance to clearness in transmission, as the static charges are allowed to escape, thus diminishing the retarding effect set up by these charges."

"Say, Ed, what are the reasons for using large wire and glass insulators in long lines?" a lineman's helper asked.

"Well, Joe, in order to secure the best possible result in the working of telephone lines, a high conductivity of the circuit is a matter of the greatest importance. The smaller a line wire is, the less its conducting power, and necessarily the greater its resistance.

The current flowing in a line has a choice of paths—either to traverse the wire to the distant end, or to leak to the ground over each insulator and down each pole to the earth. The current, however, actually divides between the two paths in direct proportion to their respective conductivities. Although the amount of electricity which leaks off at one pole is inconsiderable, yet when we remember that there are many poles to the mile, and possibly several miles to the line, we see that the total amount of leakage is by no means inconsiderable.

It is the usual rule that the insulation resistance of long telephone lines shall not be allowed to fall below a certain predetermined point per mile. Hence, it becomes of importance to carefully measure the insulation resistance of the lines at regular intervals.

We must further consider that the resistance of a line wire increases in direct proportion to its length. The result is that every line, as it is made longer, decreases the resistance of its insulation by adding more poles, at each of which there will be leakage, while it also has the resistance of its proper conductors increased, because each mile of wire adds a mile of resistance. It is obvious, then, that to maintain the conductivity of a line at its proper standard, the size of the wire must be large, thereby keeping the line conductor resistance down. Another point in favor of a large wire for long lines' use is that it can be more easily handled and is much more durable, in proportion, than smaller wire.

As to the glass insulator so universally employed for line wire insulation: The insulating power of glass is very high, also cheap and gives such excellent results. Those are the principal reasons for it being so extensively used in manufacturing of this type of insulator. But glass has some disadvantages as an insulating material, owing to readily condensing moisture and retaining a thin film of water on its surface. It is also very brittle and easily broken.

Now, boys, you are all aware that line insulators missing, wire untied and in contact with other wires, crossarms or tree branches, etc., also defects in cable, drop wire, interior wire or other equipment, may all be causes of interruption to the service. At times, some of these troubles are of such nature that they could easily have been prevented, if each one doing the work assigned to him had taken the necessary precaution to think.

A much-exploited saying used for advertising purposes, 'Eventually, why not now?' is equally applicable to our work.

It is said that this is an age of hurry. It may be so—but don't make the necessity for speed an excuse for carelessness and inaccuracy. Mr. Chairman, and fellows, that's all I have to say about 'insulation resistance.'"

Unusual Effort to Complete Call Develops More Toll Business.

An unusual piece of service performed by Mrs. Ellis Brittain, operator of the exchange at Martinsburg, Neb., that resulted in greatly increasing the toll business, is reported.

Mrs. Brittain was at her board after midnight not long ago, when she received an emergency call from a Coleridge woman,, who desired to get in immediate touch with her husband, who was utilizing the night hours to drive a truck load of stock so that he might arrive at Sioux City when the market opened the next morning. All the calling subscriber knew was that he would go through Martinsburg, probably around 2 o'clock.

As that hour approached, Mrs. Brittain, with a lighted lantern in her hand, left the exchange and stationed herself on the main road through town. When the truck came along she flagged it, and the trucker stopped and completed the call.

So highly appreciated was the service that the story spread. Since then all the other truckers in that section, where they are numerous, have been placing toll calls when necessary.

Customer Problems Should Be Company Problems.

By Wheeler F. Schall.

In this new era of expansion and activity where present-day commercial and industrial development seems to have acquired an inimitable force, barriers must be removed, distance vanquished and time erased that we might keep apace with progress.

Many means have been devised with which to attain this end. One of them stands always within your reach, an able assistant ever-ready to serve you; a means with which you may remove the barriers of time and space which stand between you and communicative contact with the

whole business and social world—your telephone!

Is it serving you properly? Does it fill all the demands you place upon it?

These are questions the telephone man should ask his customers, if it is his desire to render the best possible service with the type of equipment he has made available for that purpose.

It is possible that the type of service the customer is now using fails to serve his particular requirements. This may not be the fault of the service itself, nor of the equipment, but more, perhaps, of the demands to which the customer subjects that service. No matter what his telephone requirements may be, or demands he may place upon the service, there are facilities designed and available for use that will adequately serve his needs.

It is, therefore, the business of the telephone company to study the customer's telephone needs so that a type of service may be supplied which will best suit the purpose for which it is intended.

Occasionally troubles arise when an effort is made to obtain maximum results from a service which is found to be improperly adapted to the needs of the user. While this is cause for just complaint, it is a condition that is easily overcome through the use of proper service and proper methods.

To those thoroughly familiar with its manifold uses, the telephone is a simple, easy and practical means to a profitable end, but like many other commodities, it is found to fit different situations in different ways. It, therefore, becomes the business of the telephone company to equip the customer with proper facilities that will give the most efficient service, both from the standpoint of the company and the party served.

The public is generally of the opinion that the telephone company has nothing to sell. It regards the service it uses as though it were a thing to be had and not purchased. So part of the telephone company's dealings with its customers should be to correct this impression. The telephone company does have something to sell. True, it is not a tangible commodity that may be purchased in packages, carried home, inspected and returned if unsatisfactory, but it is a something nevertheless—and that something is "Service."

The telephone customer buys this service and is provided with it wherever and whenever it may be required. There is placed at his disposal intricate apparatus and equipment with a vast organization of trained men and women to operate this system and keep it in condition for his use. The value of the telephone instrument itself is nil unless it is connected with other telephones by a system of long distance lines, underground cables, switchboards and toll lines. Without all these, it becomes as useless to the user as the steering wheel of an automobile with a broken steering knuckle.

Telephone service is classified according to the needs it is designed to fill. With this classification there is provided various types of equipment which permit of the greatest utilization of the service in accordance with the needs of a particular customer. This classification contemplates various types of instruments, switching devices, wiring arrangements and combinations that are capable of meeting practically every requirement for business or social purposes.

Having thus worked out this classification, the telephone company provides itself with a certain stock, so to speak, on which it may draw in filling the customer's needs. From this stock, the customer is supplied with that type of service which the company assumes will best suit the requirements of the purchaser. Nor should this assumption be a means taken wholly within the company's own planning, but with the help and advice of the customer, who best knows his own needs.

Having conferred with the customer while making a study of his needs, the company is better able to choose from its stock of facilities that type of service upon which both customer and company agree will most adequately serve the purchaser's needs. And what is finally chosen only becomes adequate and satisfactory service when it is arranged for and utilized so that the customer's needs and requirements are dove-tailed to a general efficient system. This the company must constantly strive to maintain in such form as to be of greatest benefit to the customer.

Frequently, a telephone user is found whose needs have increased to proportions where his present facilities fail to give him maximum service. In many cases, this condition becomes a source of complaint. He is prone to think that the fault lies with the service. Such faults are in most instances easily adjusted if the customer will, in making his complaint, lay the facts before the company, that it may recommend any changes for the betterment of his service. But in all cases, the matter should be thoroughly discussed with the customer that his viewpoint may be considered in any contemplated changes.

There is no reason why any telephone user should not be able to accomplish the most satisfactory results in connection with his use of the service. This accomplishment, however, cannot be attained either by the customer himself or by the telephone company itself, but must, to a great extent, originate with the telephone user, and be successfully concluded through the close cooperation of all parties concerned.

These conditions are constantly arising, particularly among those that use telephone service in connection with their business. The telephone company should realize that it is only natural for these conditions to make themselves manifest; it denotes progress. The company should, therefore, endeavor to cope with the resulting problems, and to this end, endeavor to educate its customers to the fact that its interest in serving them is founded on a principle—that a satisfied customer is a friendly one.

The company should further deem it important for the common interest of both customer and itself that the customer at all times feel free to make known his wants and desires as pertains to the betterment of his service. It should be the constant aim to sell only the best service possible, and to adapt such equipment and operating methods to the customer's vaious needs that the highest efficiency is obtained as regards the desires of either party.

If at any time the customer should find his service insufficient for his present or future needs, the company should impress him with its willingness to look into the matter and gladly make any changes that might better the service. Customer problems should always be company problems whenever they pertain to telephone service.

New Long Distance Service Necessitates New Style Directory.

The Lincoln (Neb.) Telephone & Telegraph Co. has adopted a new style of directory. Introduction of new and faster long distance service has made it important that books be standardized and revised. The new order gives the subscriber's name first, his title, if any, business or residence designation, and lastly his telephone number.

The Lincoln directory, of which 30,000 copies have been issued, is the first to be printed in the new style. After critical tests for legibility and easy reference and careful study, a new style of type was adopted, which made it possible greatly to reduce the number of pages.

Ten thousand changes, in round numbers, were made between the last and present issue of the book, six months apart in publication dates. From 3,000 names in the first directory that the company issued for Lincoln in 1904, the number has grown to 30,000.

Electrical Devices Used in Testing of Psychological Character.

At a meeting of the New York Electrical Society in New York City, December 15, Dr. A. P. Link, instructor in psychology at Washington Square College of New York University, gave a demonstration of the use of modern electrical psychological apparatus for testing witnesses and other psychological purposes.

In the illustration on the next page showing the apparatus Dr. Link is seated facing the reader at the end of the instrument table. In front of Dr. Link is a small metal disk which connects with the chron-

oscope seen at the extreme corner of the table at the right. At his left is the girl witness under examination. In front of the witness is another metal disk also connected with the chronoscope. Controls for this chronoscope are operated by the male assistant at the right.

This apparatus determines the exact fraction of a second which elapses, in each instance, between the question asked by Dr. Link and the response by the subject under examination. The girl in the middle of the side of the table at the reader's right is making records in connection with this determination.

On the forward end of the table, is a psycho-galvanometer, according to designs of Dr. David Wechsler. This apparatus measures the electrical resistance of the skin of the subject under examination. Electrodes connected with the apparatus are attached to the subject's arm, which is hidden by the table in this view.

Emotions excited by the questions asked by the examiner are disclosed immediately by a substantial decrease in the resistance of the subject's skin.

Between Dr. Link and the subject is a microphone connected with a public address system, so that the audience could hear question and response. In the rear (standing) is H. F. Hopkins, who operated an electrical stethescope supplied by the Bell Telephone Laboratories and seen just at his left.

By means of a transmitter attached to the chest of the subject, the rate of heartbeat of the subject was made audible to the audience. The heartbeat quickened when the subject was asked questions arousing emotion.

Three persons selected from the audience were sent out of the room under sealed instructions. One of the trio chosen by lot went to a room on the tenth floor of the building, where a letter was taken out of an overcoat pocket. From the envelope $10 was removed, the letter was replaced and the "culprit" whose identity was not disclosed to Dr. Link or those in the audience, returned to the auditorium.

Dr. Link then subjected each of the three to the electrical psychology tests. The emotions aroused by the guilt of the "robber" became instantly evident on the records of the apparatus.

When the young man who had opened the envelope and removed the $10, was asked questions bearing on the "robbery" his quickened thumping of the heart when the key words were mentioned was instantly made evident.

In addition to the quickened heart beat of the one who removed the $10 from the envelope, "guilty excitement" was also demonstrated in the form of a moving spot of light thrown on a screen in full view of the audience. The spot shot clear across the screen when the person questioned became unduly excited.

It is believed that this demonstration was the first that has ever been given to the public of this combination of electricity and psychology. Nearly 1,000 persons witnessed the demonstration which proved that the human individual can not so control changes in his emotions as to prevent a record of them being made by these new supersensitive electrical measuring devices.

S. P. Grace, chief commercial engineer of the Bell Telephone Laboratories, New York City, is president of the New York Electrical Society, the oldest electrical society in the United States. The society has just issued a booklet describing its policy and activities. It indicates that, in presenting scientific electrical subjects in a non-technical manner to the public, great good is being accomplished in spreading correct knowledge concerning recent developments in the art.

S. P. Grace, Chief Commercial Engineer of Bell Telephone Laboratories and President of New York Electrical Society, Oldest Electrical Society in United States.

Apparatus Used at December Meeting of New York Electrical Society to Demonstrate Modern Electrical Psychological Apparatus for Testing Witnesses and for Other Psychological Purposes.

10,700,000 Families in United States Telephone Users.

About two-thirds, or 11,400,000, of the total number of telephones in the Bell system in the United States are residence telephones. These 11,400,000 residence, or as they are sometimes called, "home" telephones, serve approximately 10,700,000 families.

The excess of residence telephones over the number of families having telephones is due, in large part, to the use of extension stations. More and more the average home is being equipped with extension telephones which save many steps.

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Accurate Service—

Thorough Tests Given New Developments Before Adoption

ERY new development originated by Automatic Electric Inc. is subjected to rigorous and exhaustive operating tests before it is ted or incorporated in any standard equipment.

In our extensive research and development laboratories, various newly developed types of equipment are set up in working form and subjected to artificial loads to discover possible defects that might some day show up in operation. Individual tests often extend over a period of several months, and no newly developed device is given final approval until it has successfully withstood artificial operating conditions much more rigorous than those of commercial service.

That nothing is ever offered to telephone companies in experimental form is one of the many reasons for the uniform accuracy and reliability of Strowger Automatic equipment.

STROWGER AUTOMATIC

Automatic Electric Inc.

Factory and General Offices: 1033 West Van Buren Street
Chicago, U. S. A.

Problems Of The Transition Period

by B. D. WILLIS
Assistant Chief Engineer, Automatic Electric Inc.

THE flexibility in the use of the step-by-step principle makes it especially adaptable to conditions which require the blending together of various service operations to make a smoothly performing exchange system. For example, in the conversion of a multi-office telephone system from manual to automatic, where all the offices are not converted at one time, provision must be made during the transition period for interconnections between automatic and manual telephones.

In such networks, those telephone users having automatic telephones will connect with each other through the automatic switching equipment by means of their dials. They may also, in similar manner, connect with all lines which are multipled to the bank terminals of the automatic switches. For example, telephone engineers have sometimes felt justified in multipling all lines of manual as well as automatic stations within an exchange area to the banks of connector switches and installing a full quota of switches for handling all outgoing traffic from the automatic telephones to all terminals. Thus all connections initiated by automatic telephones are completely established by automatic switching means.

Another method frequently used is to assign, to manual lines, call numbers whose first digits or office prefixes are such that dialling them will extend connections from the automatic telephones to "B" operators' positions located in the manual offices. Automatic users wishing to reach manual users are instructed to dial the prefix only, which extends the connection to a "B" operator in the terminating manual office, who completes the connection manually through the usual plug and jack.

A third method, which provides a faster and more finished type of service, is that which is known as the "Call Indicator" system. In this case all of the digits are dialled, and following the extension of the connection to the manual office, the subsequent digits are recorded in call register devices, and are then flashed before a "B" operator on a display board as illuminated numbers, simultaneously with the lighting of a signal lamp associated with the particular plug-ended trunk upon which the connection is awaiting completion. The operator, without communicating with the calling party, simply reads off the number, plugs into the proper multiple jack, trips the ringing circuit and is ready to handle the next call.

The establishment of connections from manual telephones to automatic telephones offers little difficulty. In many cases the "A" operator who answers calls from manual telephones may complete the connections herself by extending them through automatic switching equipment by means of a dial, or other form of calling device. In other cases she may simply extend the connection to a "B" operator, whose sole function is to operate automatic switching equipment for the subscribers whose telephones are not equipped with dials.

It is not necessary that the "B" operator's positions be equipped with plugs, cords or jacks. Frequently, these "B" operators have only keys and keyboards, the boards being known as "Cordless 'B' Boards."

Without going too deeply into the "whys and wherefores," experience has shown that call indicator operation of automatic to manual traffic and cordless "B" key sending of manual to automatic traffic are faster and more accurate than ordinary manual "B" operation. Comparison of the latter with the smooth and quick automatic selection of an idle trunk by a circuit extending all the way back to the calling telephone reveals one of the reasons why such methods are being supplanted so widely by Strowger automatic operation. Only very recently has the principle of automatic selection of non-busy trunks been adopted for trunking between manual offices, although the idea was worked out and proposed by Strowger engineers more than ten years ago, when there was developed and installed at Defiance, Ohio, a telephone exchange system which was called a "Traffic Distributor."

This arrangement, in brief, was as follows:

Each telephone line terminates at the central office in a non-numerical switch, and is multipled to the jacks on a manual switchboard. The circuit arrangement is such that the line switches act on the initiation of a call to connect the calling line to a non-busy trunk at a switchboard position at which the operator is not at the instant engaged. The operator's telephone set is instantly connected thereto, and a call lamp associated with the trunk is illuminated. The operator has merely to pick up the indicated plug, insert it in the jack of the required number and press the ringing key, when she is instantly ready for another call.

The method proposed for multi-office operation was for the subscriber's operator to request, "Exchange, please" and to extend the connection through an office traffic distributor direct to a "B" operator, who, in the terminating office, would immediately request, "Number, please" and complete the connection.

The proposal of Strowger engineers to use the traffic distributor principle on A-B traffic in manual systems was somewhat ahead of the times in 1913, and met with very little approval from the large operating companies. At the present time, however, a system known as "Straightforward Trunking," developed along parallel lines and to the same end, is in use in some of the larger manual exchange areas in this country, and constitutes a long step in advancement in manual operation.

This is No. 2 of a series of articles prepared by members of the Engineering Staff of Automatic Electric Inc., covering technical features of the Strowger Automatic Telephone System.

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For sure grip or clean snip

Crescent hardened steel is what puts extra gripping power in the jaws and extra snipping power in the cutters of Crescent-Smith & Hemenway pliers for electrical use.

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Need of Depreciation Accounting

Opposing Views on Depreciation of Telephone Companies and Railroad, Gas, and Electric Light Companies—Analysis of Them in the Report and Conclusions of Interstate Commerce Commission's Recent Order—Part Three

2. We come next to the contention that it is only possible to guess at service lives. If it were the practice to use property until it is actually worn out in service, it might be possible, say the opponents of depreciation accounting, to estimate with some degree of accuracy how long it will last; but as a matter of fact, in the case of railroad and telephone companies, most units of property are not retired because they are worn out. Indeed it is often possible, so far as wear and tear are concerned, to prolong their lives indefinitely by repairs. Thus this is said to be true of a car or of a locomotive.

For the most part, units of property are retired, it is said, because of obsolescence, inadequacy, or public requirements. That is to say, they are retired because some more efficient substitute has been developed, or because the growth of business has rendered them inadequate for the company's needs, or because some public requirement has made it necessary to shift or change property.

It is urged that it is utterly impossible to predict when inventions will be made, or when business will outgrow existing plants, or when public authorities will impose requirements. This being so, the contention is that depreciation accounting is based on a theory that can not, as a practical matter, be applied except by mere guesses as to the future.

There is substance in this contention, but the future is not altogether inscrutable. It is known with certainty that most units of property will in time be retired from one cause or another. It also is known, where proper records have been kept, how long service lives have been in the past.

Some considerable period of time ordinarily elapses after inventions before they are perfected for commercial use. Advance information is thus possible as to the time when changes in the art are likely to render changes in property advisable. Nor is it beyond reason to anticipate the time when business will outgrow existing plant or when various requirements will be made by public authorities.

The telephone companies are insistent that it is possible, with the help of past experience and the advice of engineers informed in regard to modern tendencies in the art and the trend of business growth, to reach approximations of future service lives which will be reasonably accurate.

The question is whether, because future service lives can not be estimated with entire accuracy, depreciation accounting must be abandoned as impracticable. For the present it is enough to say that we are satisfied that future service lives can be estimated with sufficient accuracy, subject to public supervision and to modification and correction from time to time, to warrant the use of depreciation accounting. But in the public regulation of this matter, it is desirable to err on the side of overestimating rather than underestimating service lives, for a reason which will appear in connection with the next topic to be discussed.

WHO IS A CAPITALIST?

This talk about capital and labor as though they were separate and opposed classes is bosh to begin with. Even a barber, if he owns his razors, is a capitalist. But most people think of capitalists as men who hold stocks and bonds which are wealth.

Let it go at that; most working men own stocks and bonds, and many of them their own homes. You can't draw a line there, any more than you can draw a line between producers and consumers.—Warren S. Stone, for 20 years president of the Brotherhood of Locomotive Engineers.

3. It is urged by the opponents of depreciation accounting that as most property units are abandoned, not because they are worn out, but in favor of some more efficient substitute, the cost incurred in their retirement should be charged, not against past operations, but against the future operations which will be benefited by the increased efficiency. This, of course, is an argument which applies only when the retirement results from obsolescence or inadequacy.

The method of dealing with retirements thus suggested is permissible under the present accounting classifications, provided our approval is obtained in each instance. The disadvantages of this method are not difficult to perceive. Under it the community either gains no immediate advantage from the introduction of improvements, or the advantage is materially curtailed. The general effect of such a policy is to discourage or retard the introduction of improvements.

As we have above suggested, an attempt in this way to distinguish sharply between present and future patrons and apportion burdens accordingly is unsound. A community, if it is to progress and keep pace with other communities, must be able to take advantage of improved means of doing business as they become available and without mortgaging the future. This will involve prudence, foresight and some degree of present sacrifice; but no other course is consistent with a sound economy. Moreover, depreciation accounting attempts only to place the burden of current losses in service value upon the current users of the property, which obviously is logical.

But while the method of charging improvements against the future is not one which is wholly consistent with the fact which the depreciation method of accounting purports to record, it is a method which is open and available for use in emergencies. We are not here dealing with competitive industries but with monopolistic or semi-monopolistic industries where public regulation is needed to protect the public interest.

The choice is between permitting such an industry to charge rates which will enable it to make its depreciation charges large enough to meet every conceivable contingency, and holding its depreciation charges down to a more moderate basis but permitting the industry, in the case of some sudden and unexpected development, to spread the cost of retirements over a period in the future. In our opinion the latter course is the preferable one.

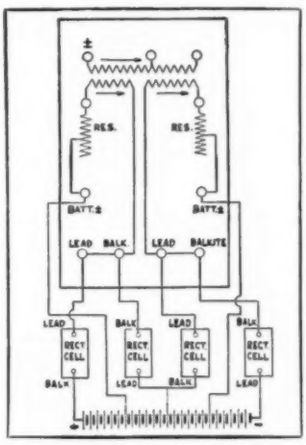
An additional reason for such conservatism in estimating service lives is afforded by the recent decision of the Supreme Court of the United States, in Board of Public Utility Commissioners v. New York Telephone Co., decided April 12, 1926.

4. It is urged that while there is comparatively little fluctuation of earnings in the telephone business, the contrary is true of railroads. This being so, the contention is that while a policy of charging off the cost of property in regular, annual installments may be well adapted to the needs of telephone companies, it is not suited to the needs of railroad companies.

The business of the latter swings periodically from a peak of congestion to a valley of depression and back again. Expenses, it is said, must be adjusted accordingly or credit will suffer.

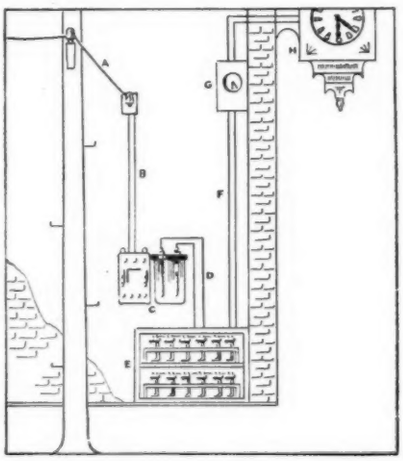
It is the custom, according to the testimony, to adjust repair and renewal expenditures in this way. At a time when traffic is moving in great volume, large amounts are spent for the repair and replacement of equipment and fixed property. In a time of traffic slump, such expenditures are curtailed.

With depreciation accounting, there



Balkite

Trickle Charging for Telephone Batteries



[A] *Alternating Current Line.* [B] *Alternating Current to Balkite Charger.* [C] *Balkite Charger.* [D] *Direct Current to Battery.* [E] *Battery.* [F] *Direct Current to Clock Operating Mechanism.* [G] *Clock Operating Mechanism.* [H] *Outdoor Clock.*

A Balkite Trickle Charge Clock System

In Balkite Trickle Charging a Balkite Charger is permanently connected to an AC source and rectifies the AC into DC. It charges a battery continuously. The DC current from the battery operates the apparatus. In case of temporary failure of the AC line the battery has stored in it enough energy to operate the apparatus alone. The sketch above shows a typical installation for a clock.

Write for this booklet

Fansteel Products Company, Inc.
North Chicago, Ill.

Please send me a copy of
"Balkite Trickle Charging"

Name_____

Address_____

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Tel. 1-8

Power for small telephone switchboards and private branch exchange boards is supplied either by storage or primary batteries or over wires from a central office. If storage batteries are used, they are charged either over wires from the central office or by a charging device which operates from the local power supply.

Power furnished from the central office or by primary batteries is inherently expensive and can be used only where the load is light.

The best source of power is a storage battery, and the best way of charging such a battery is by the BALKITE TRICKLE CHARGING SYSTEM.

Balkite Trickle Charging is simple, reliable, economical, and operates from the local alternating current power supply. It insures a constant power supply and releases telephone wires for revenue producing telephone service.

A typical wiring diagram for charging PBX batteries is shown above. This charger is arranged to handle 14 to 24-volt batteries at a maximum rate of 1 ampere. The charging rate is readily adjusted by means of resistance units to the value necessary.

Balkite charging equipment can be furnished for all commercial supply voltages and frequencies.

A complete, interesting, authoritative booklet fully describing the system, its applications and advantages has been prepared and is available on request. Write for it.

FANSTEEL PRODUCTS COMPANY, Inc.
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Trickle Charging

would be less leeway for such adjustments. They would still be possible in the case of ordinary repairs, but not in the case of retirements. It is claimed that this diminished opportunity to adjust expenditures to earnings might mean a difference in some cases between maintaining regular dividends and passing them with consequent loss of credit.

As has been indicated, this argument is inconsistent with the theory that, in the case of a large property which has "struck its gait," most retirements equalize. It is proof that many of the railroads do not wish to equalize retirement, but wish instead to adjust them from year to year in accordance with financial needs.

This method of absorbing the shock of revenue fluctuations is undesirable from many points of view. It certainly means loss of efficiency and economy in maintenance work. It is impossible, when expenditures change in this way, to have a stable force of men or to operate shops with maximum efficiency. The policy of protecting credit by manipulating maintenance expenditures is thus an uneconomic method. It also may be perilous to investors.

Credit is protected by what amounts to a misrepresentation of the facts. There is nothing on the face of the accounts to indicate, except by resort to extensive comparisons, that repairs or renewals have been deferred. Yet apparent net income is no protection to the investor if it be procured at the expense of upkeep. The deferring of proper maintenance may not be a serious matter if it be confined to a comparatively short period and if the deficiency be made good without undue delay. But extended over any length of time, such practice invites disaster, and not infrequently investors have fallen victim to such disaster.

If depreciation accounting, properly supervised, has for its purpose an adequate record of the facts, as we believe to be the case, then it is difficult to justify a departure from this method for the sake of preserving credit. Clearly some better method of preserving credit, if it needs preserving, ought to be devised than one which accomplishes its results by an incomplete or imperfect record of the actual cost of operation.

It seems true that the business and revenues of railroad companies are subject to wider fluctuations than in the case of telephone companies, and this may justify some difference of treatment. But such difference ought not to be made at the expense of a proper record of the facts.

It is possible that this problem should be met by permitting railroad companies in prosperous years to create a reserve, limited in amount, out of debits to operating revenue or income, which can be drawn upon in times of depression to augment revenue. However, this is a suggestion which obviously requires most careful consideration and, being outside the scope of these proceedings, it is not covered by the present record. We shall not undertake, therefore, to express an opinion upon it at this time.

5. It is contended that past experience has shown no need for a change in the practice of the railroads with respect to depreciation charges; that the policy of American railroads from the beginning has been to maintain their properties by the retirement method; and that it has not been shown that any disadvantage to shippers, investors or the public generally has resulted. Reference is made to Advances in Rates-Western Case, 20 I. C. C. 307, where we said, at page 332:

"It is to be borne in mind that it has been American railroad policy to maintain the property fully, in a constantly improved condition, both as to roadbed and equipment, out of current revenue."

In considering this contention it should be borne in mind that, as has been indicated, many of the more prosperous carriers have in the past secured results equivalent in many respects to those which would flow from depreciation accounting, by charging additions and betterments to operating expense or by making similar expenditures out of apparent surplus.

Many of the railroads have passed through all manner of vicissitudes. Receiverships and serious losses to investors have been frequent in the past. Deterioration of property and service has been a by-product.

It would require a prolonged analysis of past records, if it be possible at all, to determine the extent to which a proper system of depreciation charges might by forewarning investors have encouraged and facilitated plans for the averting of disaster. In such cases there have generally been so many contributing causes, such as excessive capitalization, bad management, or unwise investments, that conclusions with respect to the relative influences of various factors would be difficult to draw.

However that may be, the fact that reasons now exist which have not heretofore existed for distinguishing proper provision for depreciation from other means of protecting the property, such as accumulation of surplus or rebuilding or improvement programs under the guise of maintenance, and also for carefully limiting and supervising such depreciation charges.

There is nothing in past history which proves that depreciation accounting is unsound in principle or likely to produce harmful results. On the contrary, there is reason to believe that the railroads in the past that have best served the public and investors have been those which, in one form or another, have made provision for accruing depreciation.

6. It is claimed that if depreciation accounting is extended to cover all depreciable railroad property it will add so materially to operating expense that further increases in rates will be necessary. This contention, after all, begs the question.

If depreciation accounting is a method by which the facts with respect to the cost of operating railroad and telephone companies are recorded with approximate accuracy, then that method should be adopted regardless of its effect on rates. Nothing is to be gained by refusal to face facts or by deferring to some future date burdens which ought to be borne now. As we have seen, however, there are substantial reasons for believing that no additional burden upon patrons will result.

The Present Need for Depreciation Accounting.

So much for the objections to depreciation accounting.

We now turn to certain affirmative reasons for such accounting and for the changes in the law which were made in 1920. The interstate commerce act now provides, in section 15a, a rule for regulating the general level of railroad rates.

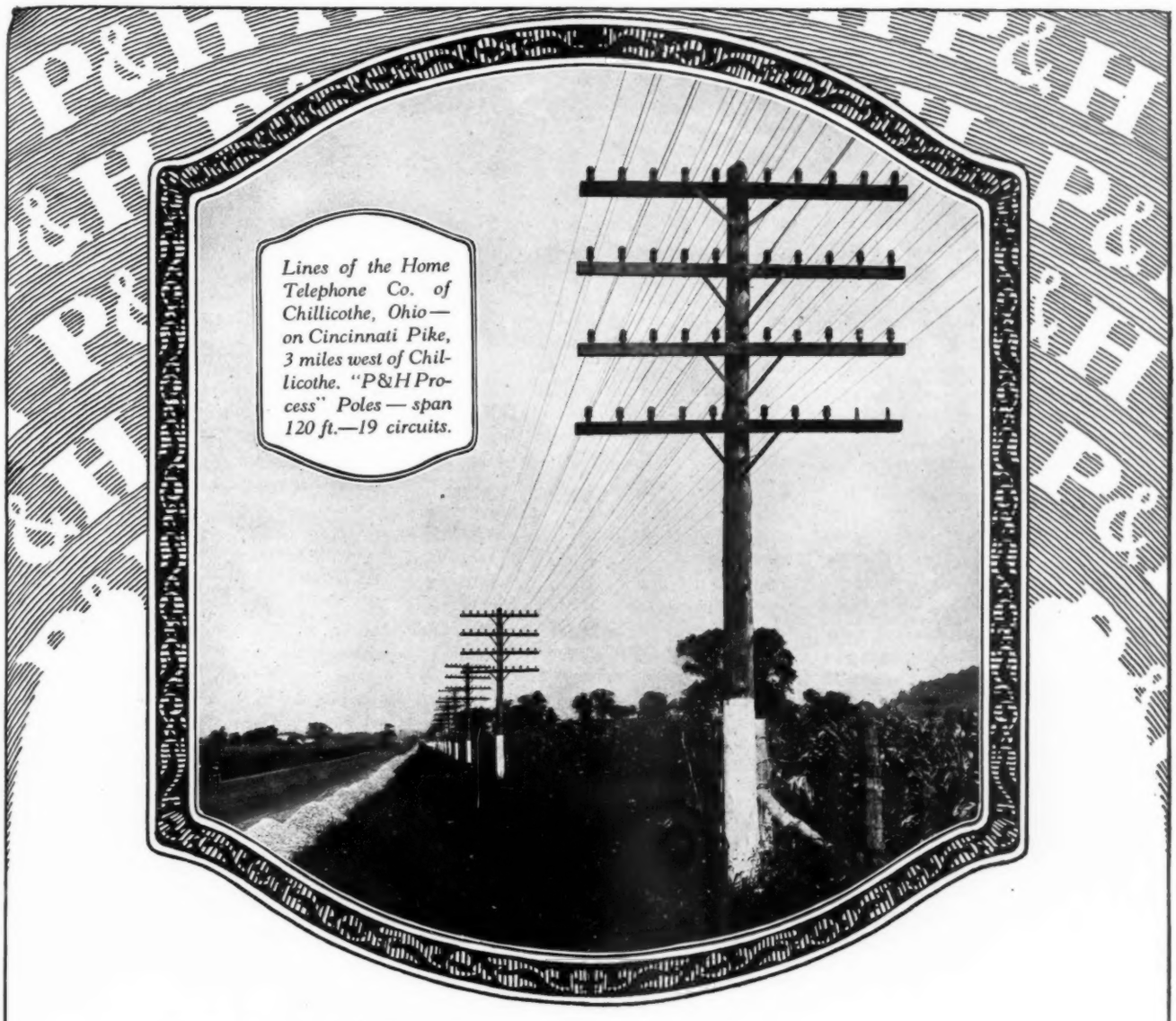
They are to be adjusted so that the railroads will earn, by groups or in the country as a whole, a certain definite return upon the aggregate fair value of their properties. Provision is made for the recapture by the government of part of the earnings of companies which are fortunate enough to earn more than 6 per cent upon such value.

In order that these provisions of the law may be successfully administered, it is necessary to have an accounting system which will disclose as accurately as possible the actual cost of operation. This is necessary for the protection both of investors and of the public. If more be included in operating expense than ought to be there, the public will suffer. If less be included, investors will suffer. This brings depreciation expense to the forefront.

If the railroad, gas, and electric companies are correct in their contentions, then the present large amounts which are being charged each year for the depreciation of equipment, and to some extent of fixed property, ought to be eliminated from operating expense. And by the same reasoning the depreciation reserves for equip-

What We Call Personality.

Everyone now believes that there is in man an animating, ruling, characteristic essence, or spirit, which is himself. This spirit, dull or bright, pretty or grand, pure or foul, looks out of the eyes, sounds in the voice, and appears in the manners of each individual. It is what we call personality.
—Chas. W. Eliot.


Lines of the Home Telephone Co. of Chillicothe, Ohio—on Cincinnati Pike, 3 miles west of Chillicothe. "P&H Process" Poles — span 120 ft.—19 circuits.

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SERVICE to us is not simply a word. It is a law upon which the whole Page & Hill organization has been built and which has won for it a nation-wide recognition. "P&H" Pole Service is prompt and complete. It does not end with the loading of the poles, but follows the shipment through to you.

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ment which have been built up, amounting all told to more than one billion dollars, ought to be made a part of accumulated surplus available for declaration of dividends.

On the other hand, if the telephone companies are correct in their contentions, then regular amounts should be included annually in operating expense, not only for depreciation of equipment but also for depreciation of many other kinds of steam railroad property for which such charges are not now accrued.

And by the same reasoning the large amounts for the retirement of property, which are included in operating expense in prosperous years and the lesser amounts which are included in years of depression, should be eliminated and charged to the depreciation reserve. Moreover, if depreciation accounting be correct in principle, then the public regulating authority must be on its guard to prevent these charges from being made either smaller or larger than they ought reasonably to be made.

Obviously a need for exact accounting in this respect exists which has not heretofore existed, and this no doubt was recognized by Congress in the amendment to section 20 under which this proceeding was instituted.

Quite apart from this special need to which section 15a has given rise, there is a general need for accurate accounting as to operating costs which, perhaps, did not exist in the past, or at least not to the same extent. In the early days of railroad construction and for many years thereafter, railroads were dealt with very much as other private industries, and they offered a field for large speculative profits. That day has gone by and railroads are now confined, restricted, and supervised in almost every phase of their activities by public regulation.

This regulation has eliminated much of the former risk of investment, but it has also eliminated much of the opportunity for large speculative profits. To attract investment under such circumstances the element of risk must be held within the closest possible limits, and this means careful provision against the uncertainties of the future.

It also means a system of accounting which will disclose as nearly as possible the actual cost of operation which is presently being incurred, and which will reduce to a minimum the possibility of misleading investors by postponing to a later date the disclosure of any part of this cost. Nor does the need for such accounting exist only in the case of investors. The public served has an equal interest.

In the old days of possible speculative profits, the sequence of receiverships, reorganizations, and recoveries which so frequently occurred involved some temporary disturbance and impairment of service but no lasting injury, since new capital could be drawn without much difficulty into the field which disaster had visited. It is doubtful whether disaster can be so easily repaired under present conditions. If the public is now to secure necessary extensions of service, and to be in a position to reap the benefit of improvements in the art of railroading as they develop, reliance must be placed upon sound economy rather than upon speculation and chance.

In our opinion depreciation accounting satisfies the needs above set forth. The essential reason is that this method of accounting conforms with far greater accuracy than the retirement method to the actual facts with respect to operating costs. Neither investors nor the public are left in doubt in regard to the costs which are currently being incurred and ought currently to be met in the interest of prudent and sound economy.

If these costs be met, the financial condition of the companies will be strengthened, and they will be able to face the future with a greater degree of assurance. There will be no need for mortgaging the future to meet the debts of the past. Investors and the public generally will be protected against extreme fluctuations in operating expense and against an unnecessarily large volume of outstanding securities demanding interest or dividend payments.

Depreciation accounting, in short, conforms to the principles of conservative and constructive finance.

Company District Managers Discuss Commercial Plans for 1927.

Executives of the Lincoln Telephone & Telegraph Co., Lincoln, Neb., recently concluded a several days' session with the four district managers, held for the purpose of going over the tentative commercial program for 1927. The managers in attendance were F. E. Behm of Lincoln, Lyle P. Young of Hastings, W. H. Caman of Beatrice and C. G. Bennett of York.

Commercial Superintendent W. E. Bell and his assistant, H. F. McCulla, presented their outline and suggestions, and these were gone over point by point. The three major factors in the program were: personnel and personnel activities; directory publication and advertising sales, and public activities and public relations.

Mr. McCulla discussed the first named subject, reviewing what had been done in the past year to develop personnel work and the results achieved, and outlining activities for the new year.

R. M. Woolfolk, who has been in charge of directory activities since the first of July, sketched the outline of his plans of consolidating and diminishing the number of directories while at the same time increasing the net revenues from this source. In the last five months, 30 per cent of the directories have been standardized as to form of printing, kind of type used, size and other elements so as to make the issues uniform in appearance and use. By next July he expected to have the work complete.

In the work of consolidation, the general plan has been followed by grouping the exchanges in a county around the county seat, the latter having the place of honor in the directory, and the one issue serving the needs of all patrons of the exchanges listed.

Uniformity of interior appearance of these books has been obtained by eliminating the side line advertising and other kind of advertising that cluttered up the book and interfered with its efficient use. This makes other advertising more valuable. As all solicitation for the 30 or 35 books that will in time serve the 123 exchanges will be under the direction of Mr. Woolfolk, all can be put on a satisfactory revenue-producing basis, with greatly increased net profits.

C. W. Motter, who has been publicity director for the greater part of the year, presented the public relations program. A greater contact with the schools than has been possible in the past has been secured, and the department has organized a speakers' bureau made up of six company executives who will be billed for around 200 addresses and talks.

The school program covers a seven months' period. Representatives will give demonstrations of a mechanical nature and also talks before classes in physics, chemistry and electricity, explaining the theory of telephony and the general character of the equipment and service, to the higher grades.

The advantages of telephone work as a vocation will be shown so as to enlist interest among those who have a leaning towards it and provide sources of future supply of workers. Switching apparatus and equipment demonstrations will be made before civic organizations and subscriber meetings. Motion pictures will also be shown.

The budget for 1927 calls for the addition of 2,344 stations. This is based on preliminary surveys, and is the mark the managers will shoot at. For 1926 the mark was 3,007, and by December 1, the number added totaled 2,554.

The development plans include concentration at various times during the year of work on revenue-producing items. A toll campaign will be staged in April, and one to secure the larger use of extension telephones in May.

Other items discussed were the legislative program, the revision of tariffs in the interest of uniformity, and commercial practices. The comprehensive plan, amended and revised, will be again discussed on January 15.

International Speed Truck in mail service of the Louisville & Nashville Railroad.

Three more Roads —

Louisville & Nashville
Wabash
Denver & Rio Grande Western

have lately added their names to the imposing list of railroads using International Motor Trucks.

International 1½-ton Heavy-Duty truck used on the Pan Handle Division of the Pennsylvania.

Some of the Railroad, Express, and Related Companies Owning and Operating *International Harvester* Automotive Equipment

American Railway Express
Atchison, Topeka & Santa Fe
Baltimore & Ohio
Boston Elevated
Canadian National Express
Canadian National Railway
Canadian Pacific
Chicago & North Western
Chicago, Burlington & Quincy
Chicago Junction Railway
Chicago, Milwaukee & St. Paul
Chicago, Rock Island & Pacific
Denver & Rio Grande Western
Dominion Express
East Mass. Street Railway
Elgin, Joliet & Eastern
Gary Railways
Great Northern
Illinois Central
Illinois Traction Co.
Indiana Service Corporation
Interstate Public Service Co.
Louisville & Nashville
McCormick Steamship Co.
Milwaukee Electric Railway
Minneapolis & St. Louis
Missouri, Kansas & Texas
Missouri Pacific
Monon Route
New York Central Lines
New York, New Haven & Hartford
Nickel Plate Road
Norfolk & Western
Northern Ohio Traction Lines
Northern Pacific
Norton Lilly Steamship Co.
Pennsylvania System
Pittsburgh & Lake Erie
Pullman Company
St. Louis Southwestern
Soo Line
Southeastern Express
Southern Pacific
Southern Railway
Texas & Pacific
Union Pacific
Wabash

INTERNATIONAL HARVESTER

Trucks—Coaches—Tractors

International Harvester automotive products are so generally used by the railroads because of the assurance of *performance* and *service* that goes with them. International truck reputation has been building consistently since the first International truck was made, back in 1904.

Rail operation reaches everywhere, but so does International service. We are proud to say that International trucks are served by *the largest Company-owned truck service organization in the world. We now own and operate 122 branches in the United States.* The railroads know that is an important factor in motor truck operation.

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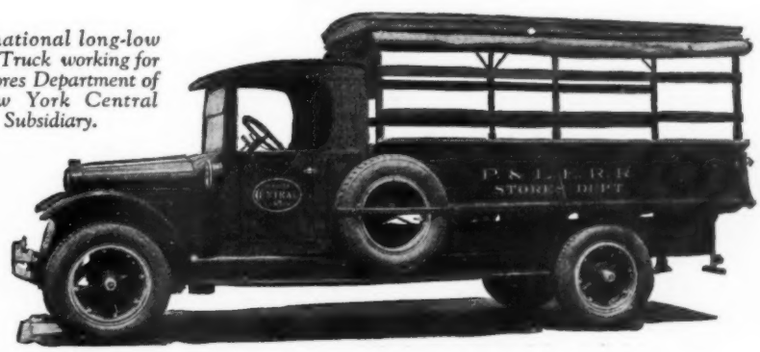

International long-low Speed Truck working for the Stores Department of a New York Central Subsidiary.

SPEARMINT

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

I must tell you the story of the bonnet of Edgar A. Guest's aunt, because it so well illustrates a moral I wish to emphasize in a story of my own.

He says this bonnet "caused more dismay than a thousand suns could wash away." And it all started one Sunday morning when his aunt found that she would be late for church unless she did some hurrying.

It was her regular custom to pin on her bonnet securely with many pins "through her top-knot," for it was "a perfect kite for a heavy wind." The wind was blowing a strong gale this particular Sunday, but, as he said, she had to hurry, so "she didn't take care with those bonnet pins." If she had, the history of her town would not have been changed from its natural bent. Now, mark you, he says: "In all that town there abided none whose life wasn't changed on that dreadful day, when my aunt's bonnet was blown away."

She had no sooner gotten out on the public thoroughfare and mingled with other law-abiding citizens, than the wind in fiendish delight tore that bonnet from its moorings, and tossed it against the head of the deacon's horse. The horse galloped wildly down the street, scattering children left and right"; a stranger grabbed for the horse's head and landed in the hospital.

The citizens let the horse pursue his wild course unmolested, after the deacon had been spilled from the chariot, and a chase for the bonnet ensued. The aftermath of that wild chase was simply awful. Edgar Guest describes it:

Birth and marriage and death and pain,
Were all swept down in that bonnet's train.
Wives quarreled with husbands! I can't relate
The endless tricks which were played by Fate.
There are folk today who had not been born,
Had my aunt stayed home on that Sunday morn.

Or, pinned on that bonnet more securely.

* * *

Smalton was a ripple of excitement. Young Sturm, the son of the leading banker, had just returned from college and a trip abroad. It was authentically reported that he would enter the banking business with his father —in Smalton; young, handsome, cultured, wealthy John Sturm! He had been away from Smalton so long that he was almost a stranger to the other young people of his age.

"Of course, he would marry," the Smalton mothers all agreed. Think what it must have meant to a crop of pretty girls, ready for the matrimonial market in a small town, to have a handsome, clever, wealthy young man set down in their midst without warning.

No one realized what it meant more than pretty little Marjorie Davis, who handled the switchboard at Smalton. Marjorie and John had been playmates as children. Once, John told her that when he grew up, and he had lots of money, they would be married; and at the school parties and dances she was always his preference. But all that was a long time ago. Time and distance played their part in the lives of young John and Marjorie—and something else.

It was natural that the influences of university and travel experiences would tend to broaden his life. He made the most of every opportunity to get the best out of life.

Marjorie went to work. It was a pity, people said, that she could not go away to college. Everyone liked her. Of course, she had very good times and was in the midst of all that was going on.

Occasionally, reports came back of John's successes; of his travel opportunities. Then people said: "He will never come back here." At this Marjorie felt a little sad. Not as sad, perhaps, as the day the train puffed out of the station bearing her former playmate and girlhood's companion away, but she did have twinges of sadness occasionally. Besides, she was always comparing young men friends with John—and they always fell short.

As I said, time and distance and other things had entered in—and some of these other things had changed her, too; for instance, she used to like to study. Now, she hadn't time, with her work and her social activities. She slumped, but she did not realize it.

Here is John's side of the story: Although time and distance and other things had made many changes in him, there were two memories in the background of his mind that had always remained very sacred to him. One was of his home and the dear home folks; the other, of the sweet face of Marjorie all aquiver and tear-stained as she waved good-bye at the station. Out in that other world he had met many talented and attractive young women, but they all fell short of his ideal—Marjorie.

It was strange how that last memory of Marjorie returned to his thoughts when he was homeward bound. So it seemed natural to go to her as soon as he could. When he entered the telephone office, she was just relieving the other operator.

"My, how pretty she is," he thought, as she came forward to meet him. As is the usual case, a number of signals appeared simultaneously which demanded her instant attention. Or was it Fate entering in?

As John stood there waiting for her attention, he took his usual quick inventory. She was beautiful, but suddenly he looked at her face intently. Then all interest in her seemed to ebb away; he saw not the Marjorie of other days.

When there was a lull in the signals, she turned blithely toward him, and he said, gravely: "Will you ring the bank for me, please?"

When he came out of the booth, he raised his hat and went out of the door; went out of her life, for in John's world, *young women did not chew gum in public places.*

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Toll Board: Two positions, desk type; 20 lines; One Cook vertical type Main Frame No. 10. Cable terminal side 900 lines; Switchboard side 750 lines. Service 1915.

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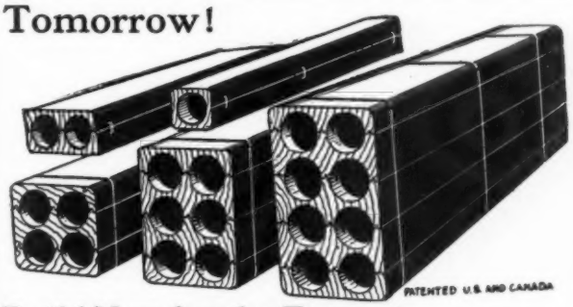
Crawford Telephone & Telegraph Co.
Girard Kansas

Tomorrow!



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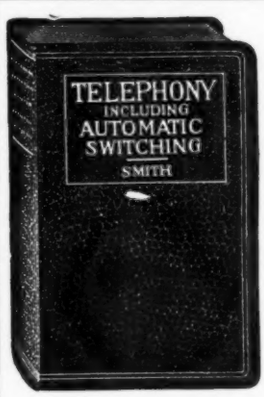

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Panstwowa Wytwornia Telefonow

Frank B. Cook, Founder of Cook Electric Co., Dead.

Frank B. Cook, of Chicago, pioneer telephone man, inventor and manufacturer, for many years a prominent figure in the Independent telephone field, passed away at Monticello, Fla., December 28, after a short illness. Mr. Cook was 71 years old, having been born at Monroe, Mich., October 18, 1855.

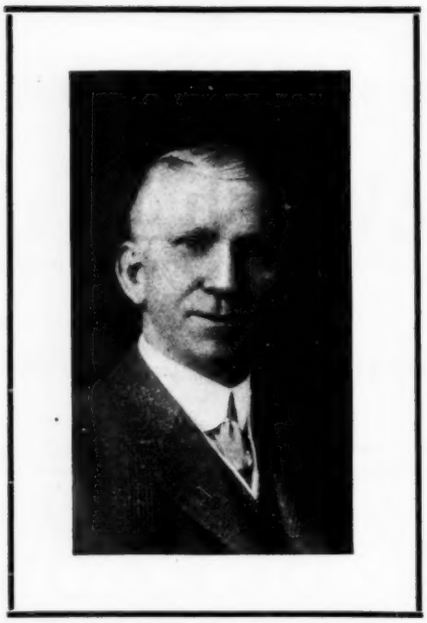
During his younger years Mr. Cook was a cabinetmaker, but, being of an inventive turn of mind and possessing unusual mechanical skill he soon directed his attention to larger affairs.

His first telephone work was done in 1878 when he was engaged in building telephone lines for William Kline, who was superintendent of telegraph for the Lake Shore & Michigan Southern Railway. He started regular exchange work in June, 1879, for the Toledo Telephone Exchange Co., which was later absorbed by the Central Union Telephone Co., a Bell subsidiary. He began as foreman of construction and filled various positions, including that of chief engineer in charge of all equipment and construction in a territory comprising some 200 exchanges in four states.

Mr. Cook resigned in 1896 and began the development of a line of telephone, switchboard, protective and distributive apparatus, most of which was the product of his own invention. He organized the Sterling Electric Co. of Illinois, which was operated at Chicago for a year, after which he moved the business to Lafayettee, Ind.

The company met with success, and Mr. Cook remained as president until 1902 when he disposed of his interests to Walter Doolittle who continued the business for several years.

On retiring from the Sterling company, Mr. Cook returned to Chicago where he undertook the manufacture, of telephone protective apparatus under his own name. In 1914 Mr. Cook incorporated the Frank B. Cook Co. He withdrew from active management the following year. In 1919



The Late Frank B. Cook Was a Pioneer in the Manufacture of Protective Equipment.

the name of the company was changed to the Cook Electric Co., which is still in successful operation.

Mr. Cook designed and built a semi-automatic telephone system which was installed at Fort Wayne, Ind. In recent years he had been interested in investments made in Florida and had spent much of his time there.

Surviving Mr. Cook are his widow, Mrs. Mary Raymond Cook; two daughters, Mrs. D. G. Ramsey and Mrs. C. C. Newburn, and a son, H. Roy Cook. He also leaves three brothers, James, Clarence and Edward Cook. The funeral services were held at the chapel, Chicago, 63rd street and Harvard avenue, January 3. Interment was at Mount Hope.

Madrid, Spain, Cut-Over to Automatic Operation.

The new automatic telephone service, entirely constructed under the technical direction of American engineers, was inaugurated in Madrid, December 28, in the presence of King Alfonso, members of the government and many outstanding business, financial and social leaders.

The system, built by the Spanish branch of the International Telephone & Telegraph Co., which controls all the telephones in the country, is expected to place Madrid among the most modern cities for efficient telephone communication.

The American engineers have already completed the installation of the automatic system in Santander, and are working on systems in Seville, Malaga and Barcelona. Fifteen thousand telephones are in use now, but the company is prepared for extensive development, a possible maximum of 40,000.

A View of 1927 by Henry Abbott of New York.

Among the forecasts made by prominent business men as to the prospects for 1927, is that of Henry Abbott, president of the Calculagraph Co., of New York, who takes the reasonable view that much depends on the attitude of the public mind.

Mr. Abbott's statement follows:

"In the field of our experience and observation increases in material and labor costs, which narrowed profit margins, have been met by a stimulated effort to develop new and better tools and manufacturing methods, resulting in the restoration of normal profit. At the same time the consuming public has benefited in getting for the same money a better product.

If our people generally will continue to talk, write and act optimistically, we know of no reason why the prosperity of 1926 should not continue through 1927."

Prices in the Metal Markets.

New York, January 3—Copper—Quiet; electrolytic, spot and futures, 13.35@13.37c. Tin—Firm; spot and nearby, $67.50; March, $66.50. Iron—Steady; No. 2, f.o.b., eastern Pennsylvania, $22@22.50; No. 2 f.o.b. Buffalo, $19@20; No. 2 f.o.b. Alabama, $20@21. Lead—Dull; spot, 7.80c.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Rehearing of District of Columbia Rate Case Authorized.

Chief Justice McCoy of the District of Columbia Supreme Court on December 23 granted the motion of the District of Columbia Public Utilities Commission for a modification of the injunction order of the court which was secured June 10, 1925, by the Chesapeake & Potomac Telephone Co. to prevent the reduction of 25 cents in the charges for telephone service.

The commission in its application said it merely wanted to hold further hearings to see if the present conditions surrounding the business of the company justified a change in rates.

"The court is of opinion," said the chief justice, "that the motion to modify the injunction should be granted, so that the valuation may be brought up to the present time on the theory contended for by the commission. It may be that on the present showing of the commission the saving to each of the rate payers will be small, but that is not a proper basis upon which to approach a decision. It is the total saving to the rate payers.

"It must not be taken, however, that granting the motion is a decision to any extent upon the contentions of the plaintiff (telephone company) as to points raised by it either upon this motion or upon the matter of fixing rates, nor is it intended to approve of a 7 per cent return. The modification of the temporary injunction is permitted only upon the understanding that the commission will proceed upon the same theory of valuation as that originally adopted by it in this matter, and this for the reason that if different principles are adopted from those originally followed the court will have before it two valuation cases instead of one, and that should not be permitted."

The commission, in its application, stated that by a revision of rates the customers of the telephone company may be saved $520,000 a year. Attorney George P. Hoover for the company denied that there could be any such saving to the users of telephones. He insisted the injunction should not be modified until the court had rendered its decision on the valuation case already under submission.

Kansas Company Authorized to Issue Preferred Stock.

The Kansas Public Utilities Commission recently authorized the issue of $97,900 of 7 per cent cumulative preferred stock by the United Telephone Co. of Abilene, Kans. The stock is to be sold at not less than par, and the proceeds are to be used to reimburse the treasury of the company for expenditures.

A detailed schedule attached to the application showed the amounts to be expended for extensions and additions.

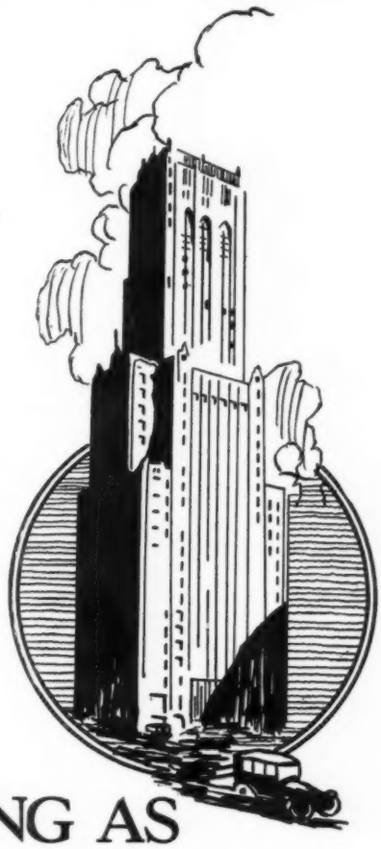
"Other Line" Charge Causes Discrimination in Toll Charges.

The Minnesota Railroad & Warehouse Commission on December 30 ordered removal of discrimination in toll rates existing at Comfrey, owing to the practice of charging for toll messages passing over the lines of the Tri-State Telephone & Telegraph Co. via Springfield, by reason of the "other line" charge of the Farmers & Citizens Mutual Telephone Co. of Springfield. The complaint was brought by the Comfrey Rural Telephone Co.

The complainant, the Comfrey Rural Telephone Co., operates a telephone exchange and rural lines at Comfrey. The Farmers & Citizens Mutual Telephone Co. operates a telephone exchange at Springfield, and a metallic iron toll circuit to Comfrey, approximately 13 miles in length. This toll circuit is the principal toll outlet from Comfrey, there being a grounded iron circuit to St. James and one to Mountain Lake.

The toll lines of the Tri-State company are connected with the exchange and toll lines of the Farmers & Citizens Mutual Telephone Co. at Springfield.

Because of the character of the lines



STRONG AS A STEEL BUILDING

IN winter your connections sustain enormous strain from high winds and crippling sleet storms.

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from Comfrey to St. James and to Mountain Lake, and to avoid confusion in routing, all calls to points other than St. James and Mountain Lake to and from Comfrey are routed via Springfield and there on to the lines of the Tri-State Telephone & Telegraph Co.

Testimony and studies show that the local toll charge between Comfrey and Springfield is 15 cents, regardless of the class of call or the length of conversation and that charges on calls from Comfrey to points on the lines of the Tri-State Company via Springfield were sometimes computed on the basis of the Tri-State company's air-line rate from Comfrey to the point of termination plus the rate from Comfrey to Springfield, and sometimes on the Tri-State company's air-line rate from Springfield to the point of termination plus the rate from Comfrey to Springfield.

On all calls terminating at Comfrey and originating at points reached by Tri-State line routed via Springfield the charge is computed on the Tri-State company's direct air-line rate. This practice results in the public paying at least 15 cents more on each message originating at Comfrey, except for those between Comfrey and Springfield, than is paid on those messages terminating at Comfrey and is therefore discriminatory.

The Farmers & Citizens Mutual Telephone Co., in making its monthly settlements with the Tri-State Telephone & Telegraph Co. for the joint toll business insisted on taking the so-called "other line" charge of 15 cents for messages hauled in both directions, whether the 15 cents has been computed in the charge and collected or not. The Farmers & Citizens company refused to adopt a through rate on the air-line basis, contending that a prorate basis of settlement under such a rate would be detrimental to it and advantageous to the Tri-State company. The studies referred to showed that a prorate of an air-line through rate by the usual method of air-line distance to point of connection would decrease the amount received by the Farmers & Citizens company only a nominal amount as compared with the existing practice and that the effect upon the Tri-State company would be immaterial, for the reason that the amount that company would receive would in some months be only slightly more and in other months slightly less.

The connection between the system of the Tri-State company and the Farmers & Citizens company at Springfield exists under a contract between the two companies, dated October 29, 1906. The Tri-State company contends that a provision in the contract gives it the right to prescribe the rates which shall be charged for messages between Comfrey and points reached by Tri-State lines which contention is denied by the Farmers & Citizens company. The commission found it unnecessary to pass upon this provision.

During the period of federal control of all telephone companies in the United States from August 1, 1918, to July 31, 1919, the government issued an order prescribing toll rates on an air-line basis applying to all telephone companies the effect of which was to eliminate all other line charges and required the messages to be rated from point to point air-line regardless of route. This schedule of toll rates was approved for the Tri-State Telephone & Telegraph Co. in an order of the commission dated November 28, 1919. A similar schedule of toll rates promulgated on the same basis as to air-line distances was approved for the Tri-State company in a commission order dated April 29, 1922.

Telephone toll lines are constructed from town to town along public highways and along railroad rights of way. If the length of a telephone line between two towns should equal the air-line distance between those towns, it would be purely accidental.

These conditions result in a very great proportion of the traffic following more or less circuitous routes. If all toll rates were based on the actual line haul or on air-line distances between points of connection of lines of two or more companies, creating charges which would be the sum of two or more local rates, users of the service of any community would be at a serious disadvantage as compared with other communities.

Confusion and discrimination in toll rates and charges has now been almost completely overcome by the adoption of uniform air-line schedules by the Northwestern Bell Telephone Co., The Tri-State Telephone & Telegraph Co., and their connecting companies.

Upon review of the facts the commission found that under the practice as then existing, a discrimination existed as to toll rates being charged the public for toll messages to and from Comfrey passing via Springfield on the lines of The Tri-State Telephone & Telegraph Co. The commission also found that the discrimination exists by reason of the Farmers & Citizens Mutual Telephone Co., of Springfield, requiring the payment on out messages from Comfrey of the Springfield or Comfrey rates, plus the other line charge of 15 cents, and that the lawful rate which should be charged is that promulgated by The Tri-State Telephone & Telegraph Co. under the approval of the order named.

Increasing Telephone Company Business by Advertising

TO those telephone companies realizing the importance and necessity of advertising in their local papers for the creation of greater good will and larger subscriber service, TELEPHONY wishes to announce the formation of a new department as another of its services to the Independent telephone field.

TELEPHONY, with its knowledge of the telephone company's problems based on over twenty-five years' experience, is qualified to prepare and submit advertising matter to Independent telephone companies for insertion in the local press. Other advertising literature, in the form of circulars, letters, folders, etc., for the purpose of creating good will and increasing subscriber service will also be supplied.

This service, originated for the benefit and aid of the telephone manager wishing announcements thoroughly applicable to his problems, will be billed to the company at actual cost to us. When apportioned among the users of the service, the expense to each will not be excessive.

In order to make it of the greatest benefit to yourself and other telephone men. TELEPHONY will appreciate your prompt inquiry, signifying your interest, whether you will make use of this service immediately or at some future time.

Telephony.
THE AMERICAN TELEPHONE JOURNAL

Service Department - 608 S. Dearborn St.
Chicago Illinois

Rates Continued in Effect so Accounts Can Show Results.

The Nebraska State Railway Commission has continued in effect until April 1 the rates now in effect in the Blue Hill district of the Glenwood Telephone Co., which were to have expired by limitation on December 31.

A condition of the order allowing the

rates was that the company should install the commission's system of accounting so that the result of increased rates might be measured with respect to revenues. Such a system has been installed, but it has not been in effect long enough to afford definite information concerning revenues and expenses.

Installation with Drop Wire Not Regarded as an Extension.

In a case where two telephone lines occupied the same highway and a patron desired service from one of these companies, the Wisconsin Railroad Commission held that the installation of a telephone by means of a drop wire direct from pole to residence was not regarded as an extension within the meaning of the anti-duplication law. This decision was made in the case of the complaint to the commission that the Hillsdale & Western Telephone Co. has extended its lines to the residence of August Fritz in the town of Arland, Barron county, without lawful notice as required by statute.

The commission's findings were that Mr. Fritz formerly had been a subscriber of the Barron County Telephone Co., but had discontinued this service on October 1, 1926, and had applied to the Hillsdale & Western Telephone Co. for service. Service from the Barron County company had been rendered by drop wire from its main line on the highway to the residence. The line of the Hillsdale & Western company was on the opposite side of the highway and to avoid trimming trees the Hillsdale & Western company had set a pole in Mr. Fritz' yard. Prior to the hearing, this pole had been removed and the trees trimmed, making it possible to connect Mr. Fritz' premises by means of an ordinary drop wire.

The commission further found that Section 195.50 of the statutes, commonly known as the anti-duplication law, did not specifically define the word "extension" and that technically any installation of a telephone, however short the line, might be regarded as an extension within the meaning of the statute. As a matter of practical administration it had been quite generally understood that the commission would not regard, as an extension, the installation of a telephone where two telephone lines occupied the same highway and where the service could be installed by means of a drop wire direct to the house.

Summary of Commission Rulings and Schedule of Hearings.

CALIFORNIA.

December 28: Hearing on application of the Farmington Telephone Co., of Farmington, for permission to discontinue its service.

FLORIDA.

January 11: Hearing on petition of Peninsula Telephone Co. for increase of rates on its Lake Wales exchange.

January 12: Hearing on petition of Peninsula Telephone Co. for increase of rates on its Winter Haven exchange.

January 13: Hearing on petition of Peninsula Telephone Co. for increase of rates on its Lakeland exchange.

ILLINOIS.

January 5: Hearing at Springfield in the matter of complaint relative to invasion of rural territory of the Palmyra Telephone Co. by the Modesta Telephone Co. near Palmyra, Macoupin county. Petition for rehearing filed by Palmyra Telephone Co.

KANSAS.

December 11: The United Telephone Co., of Abilene, authorized to issue $97,900 of 7 per cent cumulative preferred stock to be sold for cash at not less than par, the proceeds from the sale to be used to reimburse the treasury of the company for expenditures made therefrom for extensions and additions to the property as shown by a detailed schedule attached to the application, all of which expenditures were properly chargeable to capital account.

MINNESOTA.

December 30: Order issued that the discrimination in toll rates as practiced by the Farmers & Citizens Mutual Telephone Co. of Springfield, and the lines of the Tri-State Telephone & Telegraph Co. be discontinued and that the charge to the public for toll messages from Comfrey, via Springfield, to or over lines of The Tri-State Telephone & Telegraph Co. shall be only those specified in the commission's order of April 29, 1922; that the Comfrey Rural Telephone Co. and the Farmers & Citizens Mutual Telephone Co. discontinue charging for such messages under the present method, hereby found discriminatory, and substitute the approved schedule promulgated under the commission's order of April 29, 1922.

NEBRASKA.

December 30: Application filed by Dundy County Mutual Telephone Co. for authority to issue $3,000 bonds to retire current debts.

December 30: Application filed by Independent Telephone Co., of Red Cloud for permission to discontinue one farm line.

December 31: Application filed by Dalton Telephone Co. for validation of rates put into effect by mistake.

OHIO.

December 29: Joint petition filed by the Northern Ohio Telephone Co. for leave to purchase and by the Bellevue Home Telephone Co., the Local Telephone Co., the Wood County Telephone Co., the Galion Telephone Co., the Oberlin Telephone Co., the New Ottawa County Telephone Co., the Crestline Local Telephone Co., and the Medina Telephone Co., for leave to sell their property and assets as approved by their separate boards of directors and stockholders.

OKLAHOMA.

December 27: Approval given the sale of the exchange of the Seminole Telephone Co., serving Seminole and vicinity, to James Thompson.

PENNSYLVANIA.

December 21: Hearings on petitions for approval of sale of the Juniata Farmers Telephone & Telegraph Co. and The Lost Creek Valley Rural Telephone Co. to the Cumberland Valley Telephone Co.

SOUTH DAKOTA.

December 27: Increase in rates granted to the Cresbard Telephone Line and to the Dakota Central Telephone Co. at Cresbard.

"Ask the men who use them." Speak to any lineman who has attached

Bonita Cable Rings

and get some *real information*

Bonita Cable Rings

Cameron Appliance Co.

EVERETT, MASS.

In 8 Sizes

Every size for any strand diameter

Economics of Telephone Service

many well-meaning people. Instead of explaining it as has been done here—as a convenient and perfectly economic way of apportioning certain unknown and indeterminable joint costs—they have interpreted it as an oppressive tool of monopoly.

Such a view seems contrary to economic fact and business experience. In fact, it would seem to me that we may see more of this principle in the telephone business. If the tendency toward the establishment of different classes of service continues, as seems likely and as is attested by the history of many other utilities, then it would seem reasonable to infer that more and more difficulty will be experienced in allocating joint costs.

The only alternative will be to calculate the known costs on each patron's service as accurately as possible, and then apportion the remaining joint costs on the value of service principle.

Another feature of the utility business to which I should like to call your attention is that of the rate of the return on the investment. It has been the history of most economic institutions in this country that the rate of return has tended to decline.

When our utilities were in a pioneer state, the rate of return was considerably

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(Continued from page 17.)

higher than it is today for two reasons:

First, the capital was scarce in those days.

Second, there was considerable risk attached to investments in utility enterprises and the yield had to be relatively high in order to induce investors to place their capital into such ventures.

The situation today, however, is greatly changed. Within the last 25 years the capital available for investment in this country has increased at such an enormous rate that we find ourselves in an era of cheap capital. Barring wars or other catastrophes in the near future, it is likely that we shall witness still further accretions to our investment capital. If such be the case, it is probable that we shall see a rather long period of declining interest rates.

Risk Element Greatly Minimized.

In addition, the risk element, so prominent a part of the return on utility investments in the early stages of their development, has been greatly minimized. The more complete economic conquest of this country, the increased financial stability, and the more orderly introduction of mechanical improvements, all tend to dissipate the risk element attached to the telephone business. It is not unreasonable to suppose that our increased store of scientific knowledge will make possible a still further reduction of the risk element in the telephone utilities.

If these two trends as outlined prove to be correct—and their correctness is attested by our economic history—then what can telephone men reasonably expect with regard to the rate of return?

To ask the question seems to answer it. Given a rapidly-increasing supply of capital for investment, decreasing opportunities for highly remunerative employment of this increased capital, and continued reductions of risks, it seems likely that the rate of return on telephone investments will tend downward.

Such a conclusion, however, need not be viewed with alarm. At best, it can come only gradually and will work no appreciable hardship on telephone companies that are properly financed. It is well, however, for practical telephone men to keep constantly in mind the possibilities of the functioning of these long-time economic trends.

In view of the predilection of academic economists to take the utilities to task on the subject of capitalization, I should perhaps be violating one of the traditions of the profession did I not make some mention of this fascinating subject. Amid the present turmoil of such high-sounding phrases as "over-capitalization," "pyramided equities," and "stock split-ups," one is inclined to lose sight of the fundamental process involved in capitalizing an utility.

Capitalization is the process of estimating what a fixed property is worth today on the basis of what it is expected to yield during its anticipated future life. This estimate, notwithstanding the soundness of the data used and the care exercised in using it, contains an element of speculation because it delves into the future, which no man may know.

The present furor about utility capitalization appears on the surface to be little more than a dispute as to the reasonableness of certain future estimates which utility financiers have been making.

The bankers and financiers, on one hand, hold that recent capitalizations are based on accurate data and have every reasonable expectation of being fulfilled. Certain publicists, on the other hand, maintain that these capitalizations are based on inadequate data, are highly fantastic, and hence have no possibility of materializing. If this difference of opinion were the only issue involved, the matter might be dismissed as of little public consequence. The subject of utility capitalization, however, involves more than a difference of opinion between two groups.

The capitalization of a telephone company, or any other utility, results in definite future commitments at the price level obtaining when the capitalization is made. A rate base is thereby set up; a rate structure is adjusted to this rate base so as to give a certain rate of return; securities are issued for the amount of the capitalization, thereby committing the company to the payment of interest and dividends; investors become accustomed to the existing security yields, and the consuming public adjusts its ideas of the value of the service to other prices prevailing at that time.

All these elements arising from capitalization at the existing price levels have an air of permanency about them. And well they may have, for the assumption underlying all capitalization is that the price level in vogue at the time of capitalization will continue indefinitely.

In this assumption of economic stability lies the danger, both to the utility company and to the consuming public. If the general price level, including interest rates and wages, should fall and telephone rates remain constant, then the rate structure will be out of harmony with other prices.

Under such conditions there would arise agitation for lower telephone rates, which if successful might have very serious effects on the financial solvency of the company. If the contrary situation should develop and general prices rise, then the company is faced with the necessity of seeking higher rates in order to remain solvent and keeps up its service quality.

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The feeling seems to be widespread that certain utilities, telephone companies not excepted, have recently been recapitalized at present existing high prices. Such recapitalizations have resulted in projecting the present level of prices into the future and have given rise to more or less permanent commitments on the part of utility companies. Inasmuch as many people feel that prices are likely to decline within the next few years, they feel that the utility companies will be unable to make good on the commitments into which they have thus entered.

Whatever may be our reaction to this subject of utility capitalization, we must admit, I feel, the logic of the position that the validity and safety of present capitalized values is inextricably bound up with the permanency of the existing price level. How the trend of prices may move only a prophet can tell us. In the absence of prophetic information the business man must interpret the future in the light of his own judgment.

In exercising his judgment in the highly important matter of capitalization, he must make use of such experience and historical knowledge as he possesses. More than this no man can do. It is to be hoped by all friends of the telephone industry in Illinois that the men at the head of this great utility will use every precaution to avoid being misled by the current optimism into making unwise and excessive estimates of the future.

Wisconsin Bell Budgets Nearly 6¾ Millions for 1927.

That telephone construction in Wisconsin for the coming year is to go on at the same vigorous pace as formerly is indicated by the annual budget of the Wisconsin Telephone Co., which provides $6,725,000. Last year more than $6,000,000 was expended for new work.

W. R. McGovern, president, says major expenditures will include $505,000 for land and buildings, $1,825,000 for central office equipment, $1,200,000 for telephone station equipment, $2,145,000 for telephone exchange lines, and $1,050,000 for long distance lines.

It is planned to spend about $2,125,000, or one-third of the total, in Milwaukee in 1927. Considerable new telephone central office equipment is included and also a large amount of outside telephone plant to meet the normal growth.

The population of Wisconsin gained about 1 per cent in 1926, while the number of telephones increased fully 4 per cent. The Milwaukee exchange growth in 1926 was 8,200 telephones, making the total in excess of 129,000.

The total number of telephone stations of subscribers of the Wisconsin Telephone Co. was more than 304,000 at the close of 1926.

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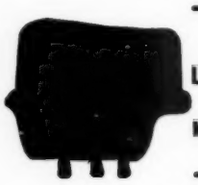
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